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"Somewhere above the ice, unwitnessed storms
Break in the darkness on the summit ridge
And the white, whirling avalanche
Blends with the storm, the night, the driven snow."

—MICHAEL ROBERTS

The Fight for K2

ROBERT H. BATES

ON 2 AUGUST 1953 all *eight* members of the climbing party of the Third American Karakoram Expedition, in excellent physical condition, were camped at 25,500 feet on K2 with ten days' food. The summit of the second highest mountain in the world (28,250 ft.) rose less than 3000 feet above us. It was our hope to establish two men at Camp IX, at 27,000 feet or slightly higher, on August 3rd; and on the following day, if all went well, to thrust at the summit.

That night we were very happy. Food and clothing were good; all members of the team had acclimatized well; a stretch of fine weather was overdue; and morale was high. Success in this great adventure, planned by two of us for 15 years, seemed near. But it was not to be.

On that night, August 2nd, two of us could think back over years of preparation. Dr. Charles S. Houston and I had been members of the American Alpine Club's First Karakoram Expedition in 1938. During that reconnaissance of K2, our party had climbed the Abruzzi Ridge, reached 26,000 feet on the southeast face, and come to the conclusion that the world's second highest mountain could be climbed. In 1939 a second American party, under Fritz Wiessner, attempted the ascent by the same route. Brilliant climbing by the leader took him to somewhat over 27,000 feet, but later Dudley Wolfe and three Sherpas, including the famous Pasang Kikuli, disappeared between Camp VII and Camp VI. Then came World War II.

K2 FROM ACROSS THE GODWIN-AUSTEN GLACIER
Photo, Third American Karakoram Expedition

Dr. Houston, who had led our 1938 attempt, William P. House, and I all through the war had cherished the hope of returning to K2. But when the war ended, the Indian Government declared that this was not the time for visits to K2; and after partition of the Sub-continent into Pakistan and India, we were told that permission to visit K2 was impossible. By 1952, we had practically given up all hope of returning to our old opponent and had successfully applied for permission to go to Makalu in Nepal, when, by an amazing change of fortune, the Pakistan Government granted Dr. Houston permission to lead an expedition to K2 in 1953. We jumped at the opportunity!

With a year to make preparations, we began work: first on personnel, writing to large numbers of friends, acquaintances and mountaineering club officers in all sections of the United States to ask for candidates. As a result we finally considered carefully about 40 men. Many of these were interviewed personally. Of necessity we turned down a number of excellent climbers, who are sure to distinguish themselves on expeditions in the future, but we were tremendously proud of the team selected.

Dr. George Bell, 27, of Cambridge, Mass., a physicist and our largest and most silent member, was well known for his accomplishments on Yerupaja and Salcantay in Peru. Robert W. Craig, 28, of Aspen, Colorado, philosopher, ski instructor, and humorist of the party, had one of the outstanding records among mountaineers of the Pacific Northwest. Arthur K. Gilkey, 26, brilliant young geologist, had directed the Juneau Icefield Research Project in Alaska in 1952, but was best known to mountaineers for his climbs in the Grand Tetons of Wyoming. Dee Molenaar, 35, geologist and photographer, of Colorado Springs, Colorado, had climbed Mt. St. Elias (18,000 ft.) in the Yukon Territory and was equally at home on difficult snow or rock. Youngest of the party, also 26, was Peter Schoening, a chemical engineer from Seattle, Washington, known for his leadership of the King Peak Expedition to Yukon Territory in 1952 and for his hobby of making a fine art of belaying. (For this skill we were all to be profoundly grateful before the end of the summer.) Capt. H. R. A. Streather, 26, of Warminster, England, who

had climbed Tirich Mir with the Norwegians in 1951, was selected as transport officer, but he later turned out to be a most valuable member of the climbing team as well. Col. M. Ata-Ullah, 50, of Rawalpindi, Pakistan, a most imaginative and determined officer, was to run our Base Camp and assist in many ways. William P. House, brilliant member of the 1938 expedition to K2, was unable to go this time, but served in the important capacity of expedition treasurer.

Long before we were to assemble with "Ata" at Rawalpindi, work had to be done: clothing, food, equipment, and funds were needed. In some ways, clothing was the easiest. We tested such items as quilted underwear and magnificent scarlet jackets filled with down. We had leather boots with rubber cleated soles and also rubber boots known as "thermos bottle" or "Mickey Mouse" boots because of their shape and sealed-in insulation. These later proved to be the warmest boots we wore on the mountain.

Our climbing equipment was good but not extraordinary. We had 7/16- and ⅜-inch nylon climbing ropes and 2200 feet of fixed rope. Tents, packs, and packboards were largely of American make, but our ice-axes and crampons were European. Our food included meat bars—each a pound of steak dehydrated to 4 ounces—Italian *pan forte,* and several precooked dehydrated vegetables. We also had baby food cereals, which required no cooking, but proved tasteless. How American babies can eat such stuff regularly I can't understand! In general, however, our food was light, nutritious, and easy to prepare. We packed it in some 4000 polyethylene bags, each containing two men's portion of one item for one meal. Larger plastic bags held the food supply for two men for one day. The work involved in making these bags from sheets of plastic, putting in the food, squeezing out the air, and heat sealing them was arduous; but thanks to members of the Harvard Mountaineering Club and other friends we completed it. This packaging proved a tremendous success on the mountain.

Heroine of this period of preparation was Dorcas Houston, whose home was inundated with tons of food and equipment, and filled at all hours with helpful packers and interested on-

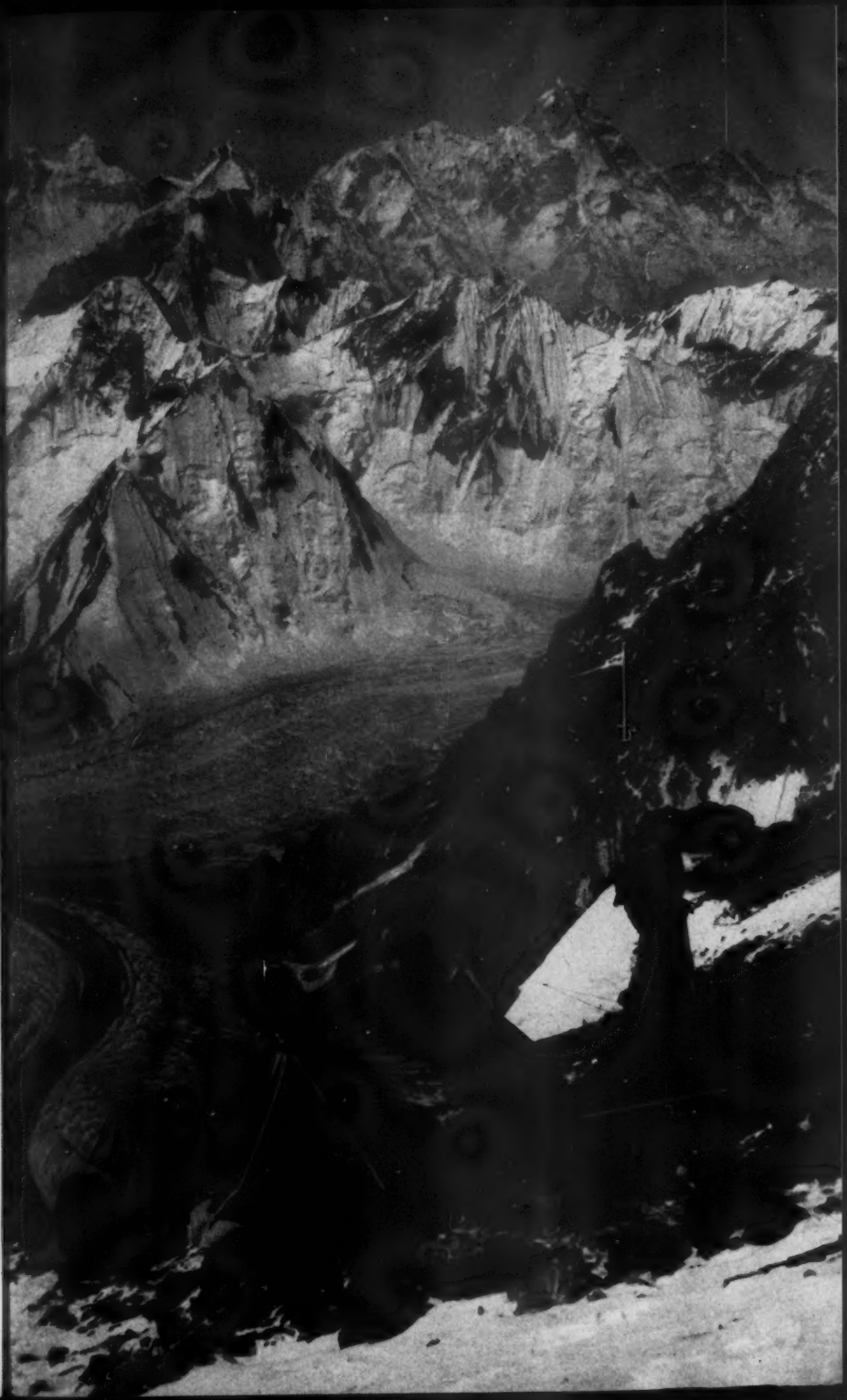
lookers. The young Houstons loved it all, even when the linoleum of the kitchen floor was gummed with a mixture of sticky raisins, excelsior and dehydrated potatoes, and flaky baby food oatmeal infiltrated the dining room rug. Casualties were inevitable. For instance, the bread knife was never the same after it cut 24 Italian fruit cakes into eight sections each. Mrs. Houston must have considered even moving into the garage during our major packing weekend when a 24-pound turkey was consumed at one sitting during a pause in the furious tempo of loading and strapping boxes.

It was Mrs. Houston, too, whose discovery of a tasty new kind of chocolate led to a gift from the company of 30 lbs. of the chocolate, 30 lbs. of another kind of chocolate, and 30 lbs. of sugar-coated peanuts, plus a cheque of $50. Members of the American Alpine Club were very generous with donations and loans, and these plus personal funds and contracts with the *Saturday Evening Post* and the National Broadcasting Co. temporarily solved our financial problems and we were able to proceed. The National Broadcasting Co. was to show our movies on television, and so we went well equipped with tape and wire recorders.

In mid-April our two and a half tons of food and equipment left New York for Karachi on the freighter *City of Carlisle*, and a couple of weeks later I flew to Karachi to meet the ship, shepherd our gear through customs, and get it on the train to Rawalpindi. All went well. The rest of the party flew to Karachi and on May 27th to Rawalpindi. We had chosen this time of year to assault K2 because previous expeditions and the Pakistan Weather Bureau were unanimous in the opinion that late June, July, and early August is the period of best weather in the Karakoram. Opinion seemed unanimous, too, that no monsoon ever reaches the Karakoram. The nearest weather station, Skardu, reports an annual rainfall of about 7 inches, and the barren rock faces throughout the Karakoram testify to its dry climate.

On June 2nd we flew to Skardu on a flight that seemed especially remarkable to Dr. Houston and me. Fifteen years before,

CAMP V (22,000 ft.) WITH MASHARBRUM IN THE BACKGROUND
Photo, Third American Karakoram Expedition



we had driven for a whole day to get from Rawalpindi to Srinagar and then had walked *241* miles over rough terrain to get to Skardu. Now in an hour and a half we had traveled the same distance! And this time we were greeted by rajahs with garlands of roses, brilliant cloths hanging throughout the bazaar, and placards in English with words of welcome. When we saw the modern hospital and moving picture theatre we were even more amazed. The Pakistan Government has done wonders in Skardu.

Capt. Streather, who had flown in earlier, met us, saying that all porters had been arranged for, but prices were high. We had estimated porter costs as three times what they were in 1938, but they cost six times as much! Twelve Hunza porters were there, too, of whom we were to take six with us on the lower part of the mountain. These people lack the humor and experience of Sherpas, but are bigger, more rugged and aggressive, and should build up an excellent tradition as mountain porters. Sherpas, of course, were not available in Baltistan, where bitterness against India for holding southern Kashmir runs high, and we were strongly advised to use Hunzas and train them as we went. They performed well.

The expedition crossed the Indus at Skardu on June 5th with over 100 porters and began the rough, two-week march to Base Camp. Drought had dried up many springs and we had great trouble getting anything but silt-laden river water to drink. At Dassu the coolies insisted that the trail along the southeast bank had been damaged by rock-fall, so we crossed the Braldu River by goatskin zhak and followed the northwest side. Up and down the cliffs of the barren river gorge we worked our way, occasionally passing through villages where delicious mulberries clustered on the trees, always within sight of distant snowy summits. At Askole, the last village on our way to the mountain, we bought *atta,* took on some 75 more coolies to carry this flour for our men, and made arrangements for mail runners. Then we were off for the Baltoro Glacier and its fantastic spires and pinnacles. Masharbrum rose above us in perfect weather,

ROPE BRIDGE ACROSS THE BRALDU
Photo, Third American Karakoram Expedition

and we had fair views of the Muztagh Tower and the Gasherbrums before turning up the Godwin-Austen Glacier, which flows between Broad Peak and K2. Six of the world's highest peaks rise in this fabulous area.

On June 19th, the day we were to arrive at Base Camp, Dr. Houston and I arose very early and went on ahead to select the site for Base Camp. Our 1938 campsites on the Godwin-Austen moraine near its confluence with Savoia Glacier had totally changed, but we finally located an even better site a little farther east. Our objective, the second highest mountain in the world, rose awesomely above us.

In the next few days we reconnoitered two different routes to the site of our Old Camp I, on the glacier near the foot of Abruzzi Ridge, and started to move up supplies. Then came reconnaissance to our old Camp II, where we found jam, ovaltine, and a 4-man Logan tent of the Wiessner party in almost perfect condition. Craig and Gilkey placed several hundred feet of fixed rope between Camps II and III, for the route is unpleasantly exposed for heavily-laden men. Our Hunzas carried loads to Camp III and helped us build tent platforms there that hung dramatically over space. This camp was 100 yards from our old Camp III, which had been dangerously exposed to stonefall. Above this point we did not take the Hunzas, who were neither equipped nor technically trained to meet the severe conditions above. They returned to Base Camp just before a storm struck the climbing party at Camps II and III.

Shortly after this storm, at Camp II, Dr. Houston neatly pulled a tooth which I had loosened earlier while biting a very tough chicken leg at a dinner given for us at Askole. One of the Hunzas, a professional dentist at home, was fascinated by the forceps and the doctor's modern methods. Later, Charlie gave him the forceps.

Above Camp III, we pushed steadily on to our old site for Camp IV, just below the House Chimney. This is a narrow, ice-filled gash about 100 feet high, that cuts the cliff band of steep, reddish yellow rock that blocks the Abruzzi Ridge at 21,500 feet. Ropes from the 1939 party still hung in the Chimney (which was first climbed by Bill House in 1938), but of course

they were entirely untrustworthy. Charlie Houston led this dangerous pitch as determinedly as George Bell had led the wicked gendarme below. Above the Chimney, Schoening placed an aluminum A-frame he had had made for the purpose in Seattle, and it proved invaluable as we hauled up 900 lbs. of food and equipment.

We found food and the remains of tents at IV, and when Schoening and I reconnoitered to Camp VI, a pitiful sight greeted us. Within the remains of two Meade tents lay three neatly rolled Sherpa sleeping bags, still with their characteristic smell, a primus stove, ovaltine, and in a primus stove box a blue bandana handkerchief filled with excellent Darjeeling tea. From this camp three gallant Sherpas, splendid men—Pasang Kikuli, Phinsoo, and Kitar—had departed on 29 July 1939 to attempt the rescue of Dudley Wolfe, whom circumstances had caused to be marooned at Camp VII. None of the four ever came back. Mountaineers should never forget their magnificent rescue attempt. They were men among men, and we paid silent homage to them.

Storms had bothered us continually above Camp II, costing us an extra day or more in every camp. Indeed, we had been forced repeatedly to work in unsettled weather. Snow and wind hammered us at Camp VI shortly after Houston, Craig, and Bell returned from a reconnaissance to the top of the Black Pyramid, as we called the culminating point of the Abruzzi Ridge. Actually the ridge is more a rib on a broad face than a true arête. From VI to VII the way is very exposed and the holds are small. This is probably the most dangerous section on the route. Loose rock continually endangers the lowest men as a group moves upward. With fresh snow over these slabs and ledges, climbing with 30 to 40 lbs. was most unpleasant.

After the storm at VI, we all established a cache on the windy col at the top of the Black Pyramid, and next day Gilkey and Schoening left very early with light loads to find a site for Camp VII. To our dismay and surprise, they could find nothing. Almost in desperation Craig and Houston helped them to carve a platform in the steep ice slope so that they could bivouac in a small tent and continue the reconnaissance next day. That night

one-third of their tent overhung the slope, but they managed to sleep, and next morning, which was cold and raw, they examined the slope where the 1938 and 1939 parties had set up their Camp VII. To their utter amazement, they found that the whole small plateau of the old Camp VII had slid off the mountain!

Now there seemed nothing to do but attempt to climb the steep ice slope that had daunted the 1938 and 1939 parties and had caused them to traverse at this point. With great skill and daring, Gilkey and Schoening now began to cut steps straight up from the point where the two previous expeditions had made the "ice traverse." Ice pitons were sunk, some 300 steps were cut—at 25,000 feet!—and gradually, as firm snow was reached, the slope began to ease. At frequent intervals throughout the day, those of us at Camp VI, where visibility was zero, talked to the two men above. Though the weather was better where they were, we were all relieved and thrilled by the news that they had forced the "ice cliff" and found an excellent position for Camp VIII! Our morale soared. If we now could firmly establish Camp VIII, we should be in a strong and enviable position. Or so we thought.

During the next two days considerable fresh snow fell, but by nightfall on August 2nd all eight of us in the climbing party

were firmly established at Camp VIII. We were all there because we wanted the carrying capacity of eight men to establish two men without delay at Camp IX, from where they would assault the summit. Our plan was for two men to make the attempt from Camp IX. The day they attempted the summit, we would move up a second pair to Camp IX to try for the summit on the following day if the first team failed.

But these plans were never carried out. On the night of August 2nd monsoon winds smashed at our exposed camp with unbelievable violence. We could not even communicate with the other tents pitched three feet away, for most of the time the drumming of the blowing snow and groans of the straining tent fabric eliminated all other sound. On the night of August 3rd, Houston and Bell reported that their tent could not hold much longer. It survived the night, but at seven-thirty next morning we heard a faint cry, "Our tent's gone!" Houston made two trips from his torn tent to the one Streather and I were sharing—that was all he could manage. We hauled him in, brushed him off, and warmed him. George Bell crawled in with Gilkey and Schoening. No man could survive more than a few minutes without shelter in this terrible blast of wind and blowing snow.

For the next few days, as the storm continued, we never knew how long our tents would endure. That was our greatest concern. Another was how we were to get liquid. Food we had, but the violent buffeting of the wind so thrashed our tents that the flame of our stoves would be sucked out soon after we managed to get a stove lighted. Some days we had tea or hot cereal, but often we couldn't manage it, despite almost continuous attempts. One can't eat much snow and keep warm nor can one melt much snow by friction, but we did our best. Since we were breathing through our mouths, however, we lost more moisture than we gained; and as our blood became thicker, we repeatedly lost sensation in our toes. Our feet were warm inside the sleeping bag, but our toes lacked sensation unless we kept kneading them hour after hour.

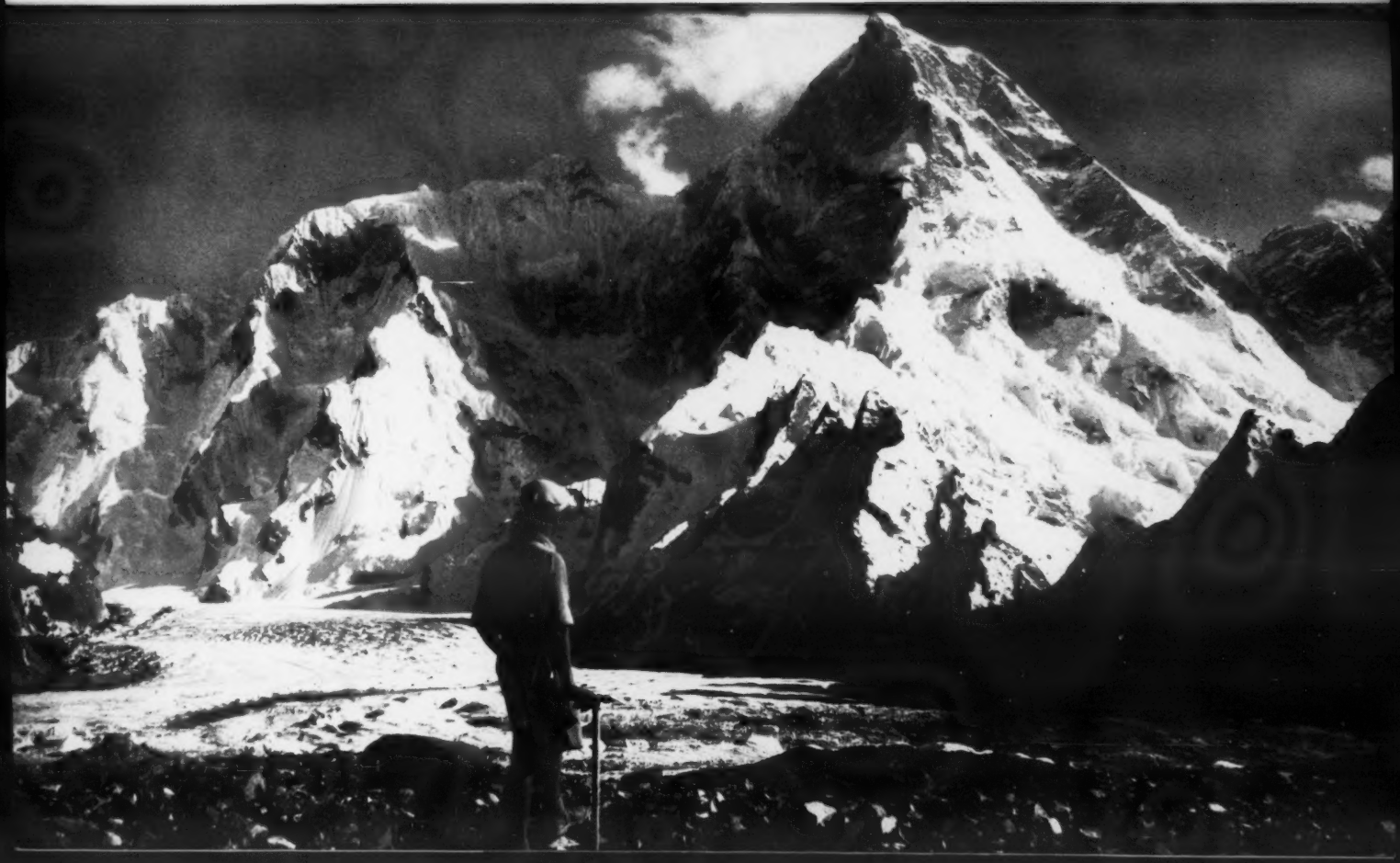
On August 7th, during breakfast, a brief lull developed in the storm. The snow stopped, the wind dropped, and we began to

discuss the state of our supplies, the condition of the snow, and what two climbers we might still be able to push up to Camp IX if the weather completely cleared. During the storm we had voted Bell and Craig, and Schoening and Gilkey to be the first and second teams to try for the summit. Art Gilkey was apparently in excellent condition for the final assault. But our optimism was brief. Ten minutes after breakfast, Art Gilkey stepped out of his tent and fainted from pain. Somehow he had developed thrombo-phlebitis, with a blood clot in the calf of his left leg.

We were shocked! Gilkey had never been ill before, and we had never heard of anyone developing thrombo-phlebitis on an expedition. Smallpox would have been no more surprising to us. There was but one thing to do: get him down before pieces of the clot broke off and entered his lungs or other vital organs. At once we wrapped him in his sleeping bag in the shattered tent, broke camp, and started to drag him down; but we had not estimated the depth of the new snow. Only 120 yards from camp we stopped, for the whole slope was saturated with new snow and in danger of immediately avalanching. Our old route had become a trap. We needed all our strength and over an hour's time to work Gilkey back through the three-foot depth of floury snow to Camp VIII, where we grimly repitched the three tents.

At this point Schoening and Craig went off to see if they could find some other route down. If they had been unable to, we would all have been in an extremely bad position, for even under favorable conditions, the slope below us would not consolidate for several days. Fortunately, the storm, which was now beginning again, held off just long enough for our two scouts to climb down to a rock ridge which they thought could be descended and from which we hoped to be able to cross to our old route below the avalanche slope. But new storm clouds rolled in to limit further observation. Over the walkie-talkie

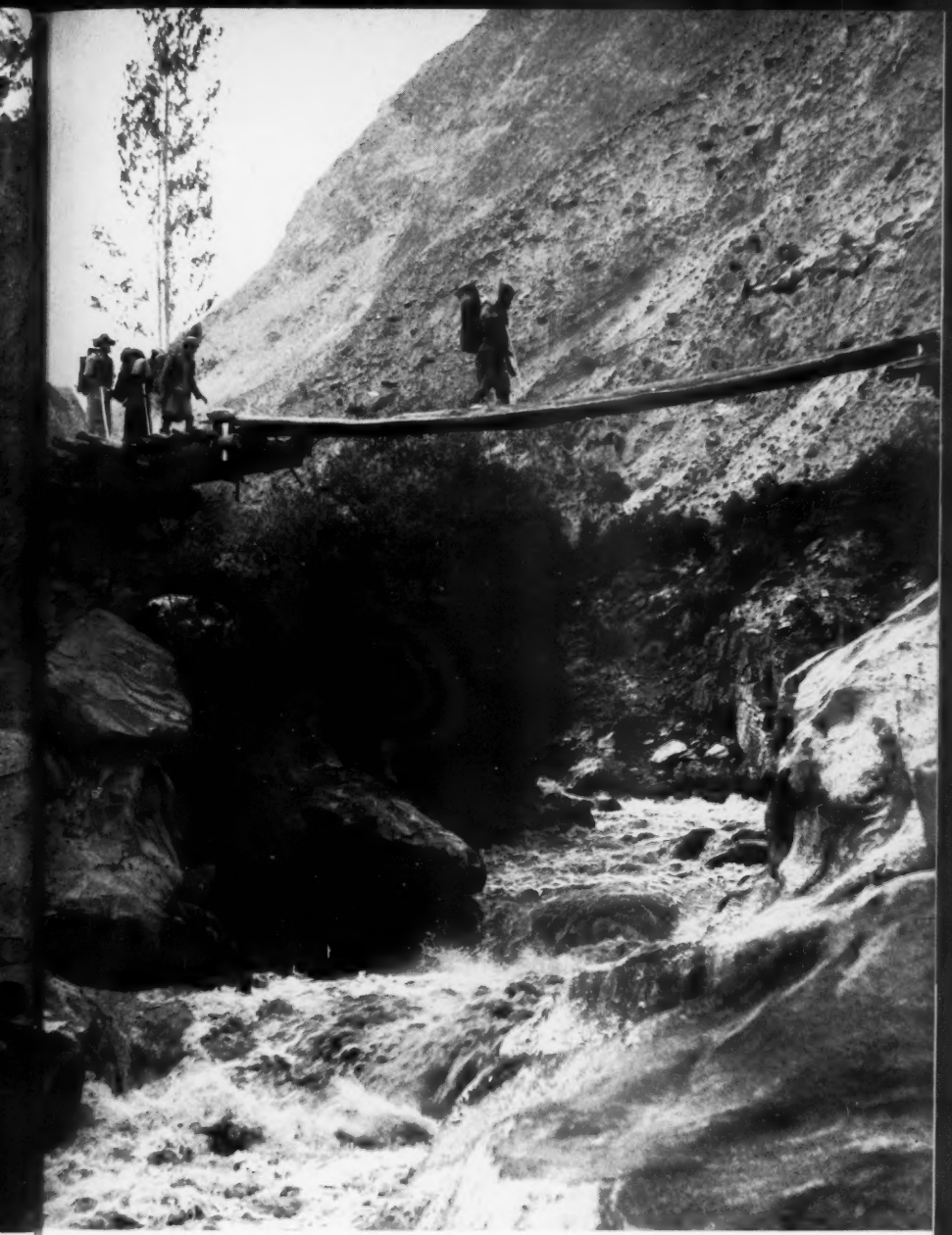
MASHARBRUM (25,660 ft.)
A British party made a fine attempt to climb this peak in 1938.
Photo, Third American Karakoram Expedition



HOUSTON EXAMINES ICE FORMATION ON THE BALTORO GLACIER

Muztagh Tower in the background.

Photo, Third American Karakoram Expedition



BRIDGE BETWEEN DASSAU AND CHONGO

Photo, Third American Karakoram Expedition

Col. Ata-Ullah gave us the weather forecast specially broadcast to us: more storm!

We doubted our ability to slide or carry the helpless Gilkey down from Camp VIII, but were determined to try it if he couldn't walk. Fresh gusts of snow tore at our tents for the next three days. We were getting low on food even with half rations, and our energy was being sapped. On August 10th we decided that two men should stay with Gilkey when the storm lifted, and the others go down and attempt to bring back food from VI. Though we all volunteered to stay with Gilkey while the others went down, Dr. Houston insisted that he must stay for medical reasons, and he chose Streather to remain with him.

On August 11th, however, Houston came to my tent. "We must take him down," he said.

Someone asked, "In this storm?"

"Yes. It means life or death for Art."

During the night a clot had entered Gilkey's other leg, and at least one piece had entered his lungs and been thrown off with difficulty. Outside the tent where Gilkey lay in his sleeping bag, ferocious gusts were pounding at the little camp, straining the tents to the utmost, but without another word we all began to pack. The venture seemed absolutely desperate, but we would have done anything for Art Gilkey, as he would have done for us. We lashed the torn tent around his sleeping bag, tied four nylon ropes to it, and started down. "How do you feel, Art?" we asked as we started off. "Just fine," he said with a drawn smile, but he knew the odds against him. I have never known a braver man.

The next hours none of us will ever forget. As the furious wind lashed us, beards, eyebrows, and goggles became coated with ice, and hands and feet steadily lost sensation. Once, while we were belaying Gilkey down a long snow couloir, he and Bob Craig, who was with him, disappeared under a powder snow

CAPT. STREATHER AT CAMP III
Note height of tent platform built out over 3,000-foot slope. Tent has "Gothic Wand" in center to resist wind and slough off snow.
Photo, Third American Karakoram Expedition

avalanche, but the rope held firm and the cold powder roared on without them. It was a near thing for Craig. The whole descent was desperate. Snow squalls blotted out everything and nearly choked us. By three in the afternoon we were nearly exhausted. Craig unroped and traversed across to our cache at Camp VII to try to enlarge the platform there and get up a tent. The rest of us, except for Bell, were near Gilkey on a steep ice slope, getting his ropes to pull over to where we could get a belay and move him horizontally toward Camp VII. Above us was a snow gully, below us nothing to halt a fall to the Godwin-Austen Glacier, nearly two miles below.

As we were in the act of moving across to a belay point, without warning George Bell fell. Whether a rope snagged and pulled him off the ice slope, he doesn't know; his feet and hands were numb and the gusts were furious. Streather, who was roped to him, was torn off and hurled into the rope between Houston and me. All of us were still several feet from the nearest belay. As I saw Houston disappear, I thrust desperately at the ice with my axe and at the same instant was thrown violently backward. Nothing, I knew, could stop us. This was the end. I bounced down over rock outcrops, and, just as I expected the next bound to be several hundred feet and end it all, I stopped!

My head was much lower than my feet, and my hood was jammed over my eyes. The rope had wound around my hands, and I was nearly helpless. Just then I heard a groan, almost in my ear. Someone pulled the ropes off my hands. I grabbed a rock and swung around. There was Molenaar with his hair on end and blood trickling over his moustache. Above me, I could see Streather trying to stand up. Then blowing snow blotted everything. A moment later I heard a cry from below, "My hands are freezing!" There, 60 feet below, on the edge of nothing and without his pack, crouched George Bell! He had been as high above us a moment before. His outstretched hands were bare and a sickly white. I climbed down to him and worked a pair of spare mittens onto his hands. His had been whipped off in the fall.

Meanwhile, Dee Molenaar had seen someone unconscious. It was Houston. I unroped and climbed carefully down to him.

He stood up when I touched him, but he didn't know where he was. There was no time to waste; we must gain shelter. "If you ever want to see Dorcas and Penny again (his wife and daughter), you climb right up there now," I said, with great intensity, pointing to where Molenaar held him on a rope. A look of fear came over him; he turned and climbed rapidly and skillfully over the difficult rock.

Gradually we assembled everyone at Camp VII. Craig anchored Gilkey securely on two ice-axes, and Streather, Craig and I began to enlarge the platforms and get up the tents. Apparently we had been saved by a combination of circumstances: Schoening had a strong belay on Art Gilkey, and just before the accident Molenaar had tied onto one of the loose ropes used to pull Gilkey across the slope. Bell's fall pulled off Streather, who fell into the rope between Houston and me, and then into the rope between Molenaar and Gilkey. He fouled onto both. In this way the weight of Houston, Bell, Molenaar, and me came on Streather, and through him was transmitted to Gilkey and Schoening, who held us all. It couldn't happen, but it did!

As soon as the tents were up, Streather, Craig, and I traversed back to the icy gully, 150 feet away, to see whether we could move Art Gilkey to Camp VII. We had called to him and he had called to us while we were chopping the tent platforms, but the storm made words indistinguishable. Now, as I crossed the rib of rock separating Camp VII from the icy gully, I saw something I shall never forget. The slope was bare. An avalanche we never heard above the roar of the storm had swept the gully. There was no trace of our beloved and gallant companion!

The shock was terrible but at the moment somewhat dulled by our exhaustion and the perils of our own position. That night Houston was continuously out of his head except when he slumped unconscious, and he needed continuous care. Thank God the gale ceased in the evening. At dawn, however, it began again, but all of us, though badly shaken and going largely on nerve, fought our way down the steeply angled icy slabs to Camp VI. It was like descending the icy roof of a cathedral, but nobody slipped.

Camp VI seemed like heaven. For the past two days we had

done the most desperate climbing of our lives, but we still had a long way to go. Next day, August 12th, we were trapped in our tents, but on the 13th we worked our way to Camp IV as Houston showed a marvelous recovery and was the last man to descend the Chimney. On the 14th, despite appalling conditions of snow and ice-covered rocks, we climbed down to Camp II, where our faithful Hunzas met us. We looked for Art Gilkey's body all the way but never found it.

The meeting at Camp II we shall never forget. Our porters fed us and cried over us and prayed for us. Our own feelings were too deep for words. Somehow all but one of us had been saved to live again and climb again and savor the joys of friendlier mountains.

We reached Base Camp on August 15th and next day left a memorial to our brave, beloved comrade Arthur Gilkey in a magnificent cairn erected at the confluence of the Savoia and

Godwin-Austen Glaciers. His ice-axe rests there. No man has a monument in a more beautiful and majestic place.

On August 17th the battered party began the return march to Skardu. Houston, whose indomitable spirit and leadership had shown from the start, had a chest injury, and Craig and Molenaar had frostbitten heels. George Bell, whose feet were badly frostbitten and who had shown tremendous nerve in the descent, now had to be carried,* and all of us showed signs of our battle for life. Still, our spirits were good. All of us who came back would climb again.

Summary of Statistics

ATTEMPTED: K2, 28,250 ft., Karakoram Range, Northern Pakistan; unclimbed and second highest peak in the world.

HEIGHT REACHED: 25,800 ft.

PERSONNEL: Leader, Dr. Charles S. Houston; Col. M. Ata-Ullah, Robert H. Bates, George Bell, Robert W. Craig, Arthur K. Gilkey, Dee Molenaar, Peter Schoening and Capt. H. R. A. Streather.

*In September the small toe and one joint of the big toe on Bell's left foot were amputated in Boston, but thanks to Dr. Houston's care this was the extent of his loss. Bell is now skiing and climbing as well as ever.

The Japanese Manaslu Expedition, 1953

Y. MITA

By April 13th all the expedition members had gathered at Sama base camp (12,664 ft.). The caravan, in two parties, consisting or 15 Sahibs, 2 Nepali interpreters, and 270 porters had taken 18 days from Katmandu, which included a particularly hazardous march of one week along the Burigandaki valley.

The party was formed* from a nucleus of Japanese Alpine Club members and selection was made by the Himalayan Committee of the Club early in 1953. The two scientific members parted company with the main expedition on the first stage of the march to continue the research which had not been completed around the foot of Manaslu last year.

The base camp at Sama was reached on April 13th and, although snow fell almost every day, the necessary preparations for establishing the higher camps were begun without delay. Nearly eight tons of food and equipment were unpacked and readied for transport onward under the supervision of party members and the more experienced of the Sherpas.

The camps were gradually extended upward, and on April 20th Camp 4 was established at Naike Col (18,373 ft.), between the North Col and Naike mountain. This col divides the Ralkia and Manaslu glaciers. While some of the party tried to make this camp as effective and comfortable as possible, determined efforts were made by others at the same time to proceed through the steep and dangerous icefall region leading upward to the North Col. Camp 5 (19,685 ft.), Camp 6 (20,013 ft.), and

*A list of the members of the party will be found at the end of the article

MANASLU (26,247 ft.)

Nepal, eighth highest unclimbed peak, showing northeast face.

Photo, S. Takebuchi

Camp 7 (21,654 ft.) were established in stages, and finally, on May 15th, Camp 8 (23,294 ft.) was pitched on the North Col.

Over 500 bamboo stakes, each about 6½ feet long and with a colored flag, were planted along the route at intervals averaging 50 yards on the glacier and the tortuous paths through the seracs from Camp 2 to the North Col. These guide flags served to mark a clear packing trail for the entire duration of the climbing from Base Camp to Camp 8.

Our original plan was to attack the summit on or before May 19th, but the unkind elements forced us to postpone our schedule. As previously arranged, from May 1st weather reports were transmitted from All India Radio; these despatches referred to the frequent appearance of monsoon conditions over the Bay of Bengal. The situation was such that, if we were to avoid being caught by the monsoon in this region, it was imperative that the climbing be finished and done with at the latest before the end of May.

On the morning of May 19th the assault party of K. Kato and Yamada left Camp 8 to reconnoiter the high plateau leading to the summit. They encountered soft snow and were forced to plough knee-deep all the way, and by 3:00 P.M. could only attain the altitude of 23,622 feet. As the slope steepened abruptly at that height and in the absence of a suitable spot to pitch a tent, they decided to dig a hole in the hard snow where they spent the night. Kato slept soundly while Yamada had to wake up frequently to clear the snow which clogged the entrance of the hole during the night. That a bivouac at such an altitude was managed without much difficulty came as heartening news to us. Admittedly both these climbers were not without experience in this type of improvisation in the snow. In particular, Kato had faithfully recorded the results of over 70 nights spent in such bivouacs during winter ascents in the Japanese Alps.

Unfortunately, the weather deteriorated the following morning, and fresh avalanches were noticed sliding down on either side of the snow cave in which the two had bivouaced. Since

MANASLU from the base camp and the Manaslu Glacier.
Photo, by T. Yoda

the situation was too precarious for further ascent, they reluctantly returned to Camp 8.

By this time the physical condition of the entire party was becoming a problem, and the altitude affected some of the Sherpas rather seriously. Sirdar Gyalgen and young Migma Steri were ordered by Dr. Tatsunuma to climb down to Base Camp. Sarki, strongest of them all and the one who had gone up to Camp 5 on Annapurna, was taken down to Camp 4, escorted by Taguchi. No less a blow to our plans was the discovery that both provisions and fuel at the higher camps were insufficient

for a decisive effort. The young Nepali student Dilli, who had cheerfully volunteered his services as interpreter, became ill at Camp 4 and was sent down to Base Camp on a Sherpa's back.

An order was then issued to the upper camps for a general withdrawal to Camp 4 on Naike Col where a reunion of all members was held at what had now become our most forward camp. Varieties of fresh food—considered luxuries at these altitudes—cooked by the veteran sherpa Pancy at Base Camp were carried up to Camp 4 every day. Even snowy days did not deter

Top—NORTHEAST FACE OF MANASLU FROM CAMP 4
Photo, Japanese Manaslu Expedition

Bottom—MANASLU FROM BINTATAKOTI
Photo, Japanese Manaslu Expedition

the two teams of faithful porters who relayed at Camp 2 to keep open this flow of invigorating rations. With the camp now well stocked with provisions and appetities fully restored, both Sahibs and Sherpas became as fit and well as ever. The weather on these days held good in the morning, but more often than not turned cloudy in the afternoons with snow flurries or blizzards following.

By May 30th all the camps up to No. 8 were again reoccupied. However, strong winds prevented the attack party from leaving Camp 8 on their final assault until the morning of the 31st when the wind died and the skies cleared up completely. K. Kato, J. Yamada, and S. Ishizaka comprised the assault group, supported by six strong young Sherpas led by Yamazaki.

Leaving Camp 8 at 9:30 A.M., the party made good time because of more favorable snow conditions, and the spot at which they had bivouaced previously was passed much earlier in the day. Here the slopes rose sharply to a gradient averaging 50 degrees. The rock slabs were often felt under 12 inches of snow, and the going grew perilous with the heavily laden Sherpas. No sooner had they reached a point only 50 feet below the edge of the plateau, with ropes about to be fixed for the Sherpas, when Ang Tember slipped down the steep face, disappearing beneath a projecting rock. Most fortunately, however, Ghundi, who was dragged downwards by Ang Tember, saved himself and Tember by firmly anchoring himself with his crampons on this rock. Ghundi is said to have carried up loads to over 26,247 ft. on Everest, and he more than lived up to his reputation on this occasion.

By 2:40 P.M. the entire group stood east of the rock tower at the extreme west edge of the plateau. A whymper tent, bolstered by pitons, was pitched at the measured altitude of 24,607 feet.

Top—CAMP 4 AT NAIKE COL,
May 25th.
Photo, Japanese Manaslu Expedition

Bottom—PASSING THROUGH DIFFICULT ICEFALL,
May 26th.
Photo, Japanese Manaslu Expedition

To Yamazaki fell the unwelcome task of leading the support party of Sherpas back down the precipitous slope. The Sherpas seemed frustrated and unhappy, and to add to Yamazaki's predicament, he himself was suffering from dizzy spells. Kato and Yamada saw them off on the first leg of the descent with an anchored rope enabling each Sherpa to descend the icy slope step by step. Approximately 650 feet of painfully slow progress had been made when Hlakpa and Ang Norbu lost their footing, dragging Yamazaki down with them. Yamazaki happily had enough strength left to anchor the fall of the two Sherpas by using his ice-axe in the nick of time. The party finally made it back to Camp 8, arriving in a state of complete exhaustion.

As usual, later in the day the sky had become overcast with cumulo-cirrus clouds, accompanied by westerly winds and snow-showers. At 6 P.M. the temperature was minus 25 c. while the minimum during the same night was minus 32 c.

Meanwhile at Camp 9 the assault party of three were enjoying *Miso-zosui,* made with alpha rice for dinner *(miso*–paste made from soya beans and normally used in soup; alpha rice—rice dried after boiling and ready for immediate use either with hot water poured over it or boiled). Yamada slept well, but the other two had a restless night mainly because of the narrowness of the tent.

The night settled calm and quiet, and June 1st dawned even finer than the previous morning. Getting up at 4:30 A.M., they left Camp 9 at 7:00 A.M., roped in the following order, Yamada, Ishizaka, and Kato. The ice plateau extended up as far as the summit, and the surface of the ice was so hard that even the spike of the ice-axe was found of no avail. Only the sharp points of the crampons could be relied upon.

Complicated crevasses were encountered all the way although their mouths were not opened too wide for comfort. The guide flags had to be thrust into narrow cracks in the ice. The ice plateau swept upward to the summit in three broad steps. The foot of the second step was gained at 9:30 A.M. and its ascent was rough going as it was necessary to plough through powdered snow patched with *skavra.* Clouds began to appear ominously in the west and the gathering winds spattered snow on to the southwest edge of the plateau. The summit, appearing as un-

attainable as ever, looked down forbiddingly on the three tiny black specks toiling upwards so slowly as to seem motionless.

At length the third step was approached. Here a halt was called to discuss the advisability of further ascent. Height, 25,427 feet, and only another 1,230 feet to the summit! It was high noon already, the route left to cover was estimated to require another 5 hours under similar conditions. Considering the fickle weather, the limited time for descent, and the physical condition of the members, it was decided to retreat. Indeed it must have been a bitter pill for these three. One can only imagine their chagrin. However, they were faithful to our order to be brave in the face of an inevitable retreat.

According to their opinion the balance of the route leading up to the summit presented no formidable obstacles of a technical kind. Well acclimatized climbers who might be able to stay overnight in, say, a Camp 10, if such could be established, would stand a reasonable chance of attacking the summit on the following day. Of course, this is a conjecture based on all factors being just right at one and the same time.

To mark the altitude reached, a Japanese flag was fastened on the spot with pitons and a picture taken of it. Camp 9 was reached at 2:40 P.M., where everything was picked up, save the tent for the descent from the plateau. Snow conditions had so deteriorated during the day that an hour and a half was taken to cover a 500-foot descent. Members from Camp 4 observed this descent with not a little anxiety, thinking that some injury might have overtaken the party. With the dangerous section of the slope negotiated, the climbers were met by the support party from Camp 8 and all continued to Camp 7, where they stayed overnight.

Thus were we beaten in our bid for the summit. There remained no opportunity to repeat the attack because of our having already exceeded the time limit set in our schedule. Most of the members and Sherpas had already been above Camp 4 from 30 to 40 days, and it was clear that another immediate attempt would have been beyond their physical powers. Food and fuel were again running short, and the weather heralded the approach of the monsoon.

By June 3rd all the camps had been evacuated, and the entire

party reached the home-like atmosphere of the Base Camp to be warmly welcomed by good old Pancy and others of his kin. After an existence of several weeks in the white realm of snow what a welcome relief it is to be back in a valley carpeted with green! Spring was in the air, and the sweetest fragrance was wafted from the alpine flowers in full bloom. Yaks from Sama and other neighboring villages roamed lazily on the pastures around our base camp, and the bells of different kinds slung around the necks of these animals made sweet and soothing melodies.

On the evening of June 2nd, preparations were afoot for a grand banquet, and a few bottles of wine had already been uncorked when the interpreter Sagar rushed in to the mess tent with the stupendous news: Katmandu Radio had announced that Everest had been scaled by two members of the British party. At first, of course, we rather doubted the news, but a few minutes later a subsequent report arrived, confirming the news source as the British Embassy at Katmandu and that the two members were Hillary and Tensing. The news to us was sensational without parallel. Heartfelt admiration was expressed for the British party and delight that it was they who had gained the victory after 10 tremendous efforts spread over 32 years. There was also a slight tinge of regret perhaps that there were no higher mountains left to climb on the face of the earth. A congratulatory message was despatched forthwith by our first postrunner to catch the British party at Katmandu.

On June 8th our base camp was completely evacuated, and the return journey was begun to Pokhra via Ralkia Pass. Along the way to the pass the magnificent northeast face of Manaslu could be seen, looking as defiant as ever. The slope leading up to the plateau was scarred with the paths of more than ten avalanches that had smashed their way from the edge of the plateau down to the level of Camp 7. This slope was last seen from Bimtakoti on the day following the Ralkia Pass crossing, and there was no doubt whatsoever of its steepness. Bidding our last fond fare-

MORGENROT ON MANASLU
from the base camp, 5:00 A.M., 1 June 1953.
Photo, Japanese Manaslu Expedition

well to the huge white castle of Manaslu from the west, we continued our march to Pokhra while discussions about the next year's route were carried on enthusiastically each night in camp.

THE MEMBERS

Y. Mita—53. O. B. from Keio University Alpine Club.

M. Takagi—41. O. B. from Tokio Univ. A. C. Professor of Kobe Univ. Climbing leader at high elevations.

J. Taguchi—41. O. B. from Tokio Univ. A. C. Together with Takagi has had several years' experience in climbing in the Swiss Alps.

S. Takebushi—47. O. B. from Waseda Univ. Ski Club. Participated in the World Students Ski Championship of 1928, held at Cortina D'Ampezzo in Italy. Member of Japanese Nanda Kot Expedition 1936. Together with Takagi and Taguchi joined in the Manaslu Reconnaissance Expedition last year. Chief of the sports division of Mainichi Press.

T. Kato—42. O. B. from Kyoto Univ. A. C. Has had frequent experiences with Mongolian expeditions. Transport officer.

H. Tatsunuma—37. O. B. from Keio Univ. A. C., M.D. Medical officer.

M. Murayama—34. O. B. from Tokio Univ. A. C. Assistant Transport officer.

K. Kato—31. O. B. from Keio Univ. A. C. In charge of equipment.

J. Yamada—30. O. B. from Keio Univ. A. C. In charge of provisions and meteorological survey.

J. Muraki—29. O. B. from Waseda Univ. A. C. In charge of radio and various other instruments.

H. Yamazaki—28. O. B. from Hokkaido Univ. A. C. Assistant medical officer.

S. Ishizaka—25. O. B. from Nippon Univ. A. C.

T. Yoda—36. Photographer from Mainichi Press.

NORTHEAST FACE OF MANASLU
from route to Ralkia pass, June 9th. Summit can be seen just to the right of the pinnacle. Many traces may be seen of avalanches from the plateau.
Photo, Japanese Manaslu Expedition

The Japanese Manaslu Expedition, 1953

Scientific Party

S. Nakao—36. O. B. from Kyoto Univ. A. C. Botanist. Prof. of Naniwa University, Osaka. Member of Manaslu Reconnaissance Expedition last year.

J. Kawakita—32. O. B. from Kyoto Univ. A. C. Anthropologist. Prof. of Osaka University.

The figure after the name indicates the age.

The Sherpas

Name	Age	Himalayan Club No.	Previous Expeditions
Gyalgen (Sirdar)	39	57	36 Ev. 38 Ev. 39 K.K. 46 Nun Kun, 49 Pyramid, 50 Anna., 51 Chau Khamla, 52 Manaslu.
Pancy (Cook)	47	51	36 Ev. 37 Garh., 38 Sik., 39 Sik., 49 Pyramid, 50 Anna., 51 Garh., 52 Manaslu.
Ang Tering IV	39	101	36 K.K., 47 Garh., 49 Pyramid, 50 Nepal, 51 Garh., 52 Manaslu.
Sarki	34	157	46 Nun Kun, 46 Chomo Yumo, 50 Nepal, 50 Anna., 51 Garh., 52 Manaslu.
Hlakpa	29	164	49 Pyramid, 49 Panchi Chuli, 51 Panchi Chuli, 52 Chau Khamba, Sugar Peak.
Ang Norbu	23	172	52 Ev.
Nibma Sitar	29	168	47 Sik., 48 Lhonak, 52 Ev.
Nima Tensing II	24	177	52 Nepal, 52 Sugar Peak.
Ghundi	28	167	52 Chau Khamba, Ev.
Ang Tember	29	179	52 Kamet.
Ang Dowa	24	(unregistered)	52 Ev., 49 Pyramid.
Migma Steri	26	"	52 Ev.
Kippa	28	"	52 Ev.
Nym Temba	20	"	52 Ev.
Ang Tering V	29	"	New.

Liaison Officers

Dilli Bahadur Verma from Katmandu, joined the 1952 Manaslu Reconnaissance party.

Sagar Prasad Sharma from Katmandu.

Summary of Statistics

Attempted: Manaslu, 26,247 ft., Nepal; eighth highest peak in the world and unclimbed.

Height Reached: 25,427 ft.

Personnel: Leader, Y. Mita; party listed in article.

Nun-Kun

BERNARD PIERRE

THE NUN, 23,410 feet high, is the culmination of the Nun-Kun massif about 60 miles as the crow flies from Srinagar, capital of Kashmir. It was first scaled 28 August 1953 by an expedition consisting of Mrs. Claude Kogan, Mr. Michel Désorbay, and Dr. Jean Guillemin, all French, Mr. Pierre Vittoz, a Swiss missionary residing in Leh Ladakh, two Indian Himalayan experts, Flight Lieutenant N. D. Jayal and Captain K. C. Johorey of the Bengali Sappers, and myself as leader. Jayal had taken part in the Indian expedition to Trisul in 1951 and both he and Johorey had been to Kamet in 1952.

The expedition left New Delhi on July 11th and reached Doda on July 13th, the end of the rail and road portion of the route. From Doda, which is south of the Nun-Kun massif, it set forth with a hundred or so porters on the 150-mile journey and, passing through Kishtwar and Yurod, arrived at the foot of the Nun on July 30th. Base Camp was set up at 16,000 feet on the south side of the mountain.

British expeditions had previously attempted the peak (in 1934 and 1946) by way of the east ridge, but the west ridge was selected for our attempt. Both Waller in 1937 and Vittoz in 1952 had reconnoitred this approach and had concluded that it afforded the greater chance of success.

By August 1st Jayal, Vittoz, and Bernard Pierre had established Camp I at 18,000 feet, but bad weather promptly set in and drove us down to Base Camp. Not until August 8th was it possible to set out again, when Claude Kogan and Pierre Vittoz scouted a route onto the west ridge, which is defended by a huge tower of rock and snow. As a result, on August 10th, Désorbay,

Guillemin, Bernard Pierre, and Ang Tharkay, sirdar of the six Sherpas, moved up and established Camp II at 19,200 feet. The next day Désorbay, Ang Tharkay, Pemba Norbu, and Bernard Pierre attempted to establish Camp III, but fog and snow intervened so that only a provisional camp was set up at 20,500 feet.

The weather now grew much worse and forced the entire party to withdraw to Base Camp where we were doomed to be held inactive for a full week. The snow eventually stopped falling and, by August 21st, Claude Kogan, Vittoz, Guillemin, Désorbay, Ang Tharkay, and Bernard Pierre were again at Camp III which had been moved up to 21,000 feet. Bad weather, however, once more settled in and, on the morning of August 23rd, I decided upon a second retreat. A thick fog made the descent very risky and as the six climbers, on two ropes, came in sight of Camp II, they were caught in an avalanche. One rope managed to halt itself after a fall of some 50 yards, but my rope, with Ang Tarkay and Désorbay, was carried down approximately a thousand feet. We were fortunate enough to suffer only concussions and bruises, but further climbing was temporarily out of the question and we all continued down to Base Camp on the 24th. With so much bad weather and especially the heavy snow we often looked across toward K2 and speculated on the effect of such conditions on the chances of the American expedition over there. We often thought of them and especially of our friend George I. Bell, with whom we were on Salcantay last year.

Again the weather improved, and again we moved up for a final assault. Claude Kogan and Pierre Vittoz were the only ones in condition for this attempt, but I determined to go as far as Camp III, with Sherpas at Camp II and Guillemin and Désorbay at Camp I, in support. The leaves of the two Indian officers had expired, so they were unfortunately forced to depart.

When we reached Camp III, or rather its site, with Pemba Norbu, we found that it had been wiped out by a tremendous avalanche. Nothing was left. Fortunately enough, we had with us a little two-man tent into which we crowded for a cold, uncomfortable night with no stove to heat our few provisions.

The next day, the 28th, was fine and at 7:30 we left the tent. We were on two ropes, Claude Kogan with Vittoz, and I with

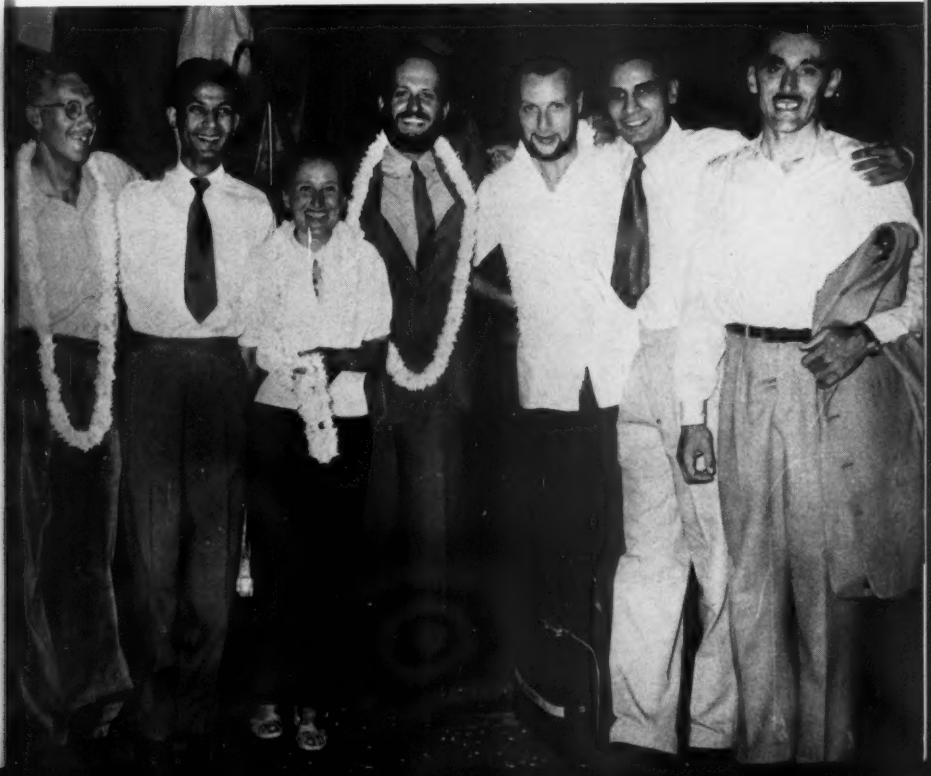
Top—THE NUN-KUN

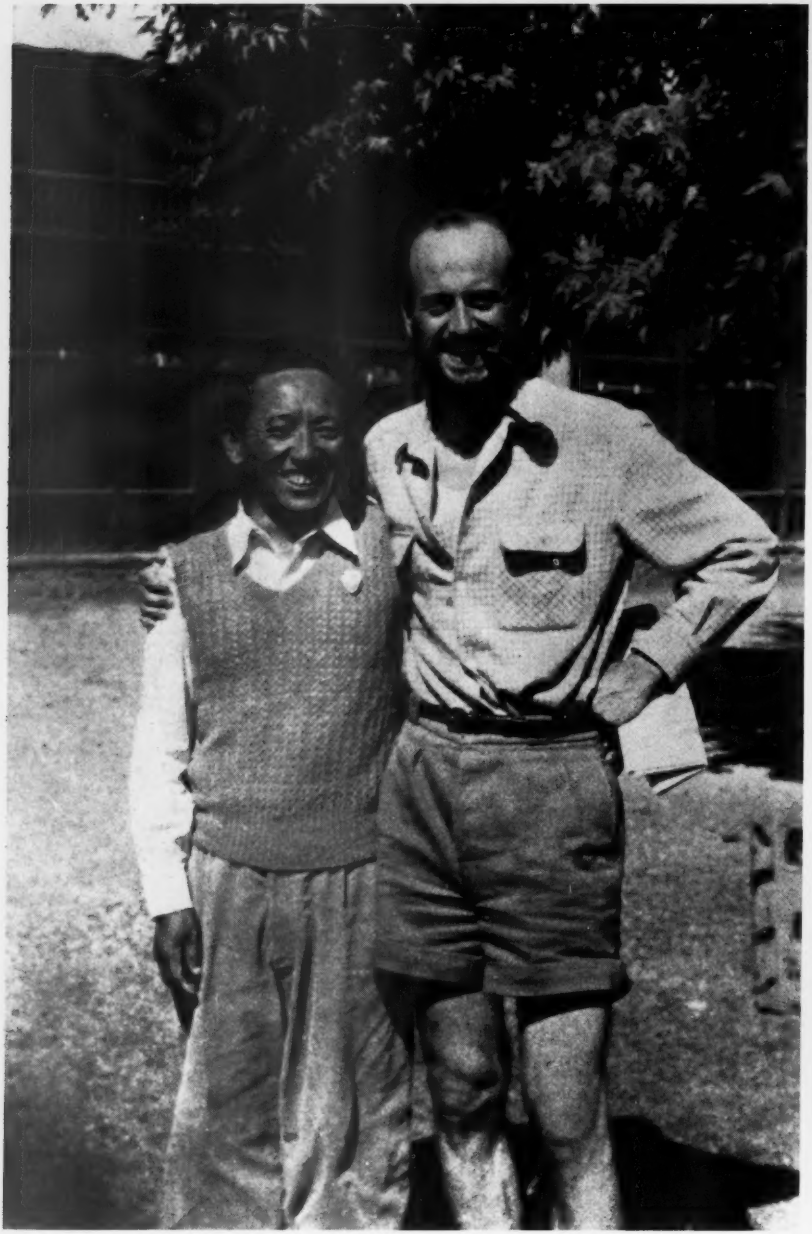
Photo, Bullock-Workman

Bottom—MEMBERS OF THE NUN-KUN EXPEDITION

left to right—Pierre Vittoz (Switzerland), Nalini Jayal (India), Claude Kogan (France), Bernard Pierre (leader, France), Michel Desorbay (France), K. C. Johorey (India), and Jean Gullemin (France).

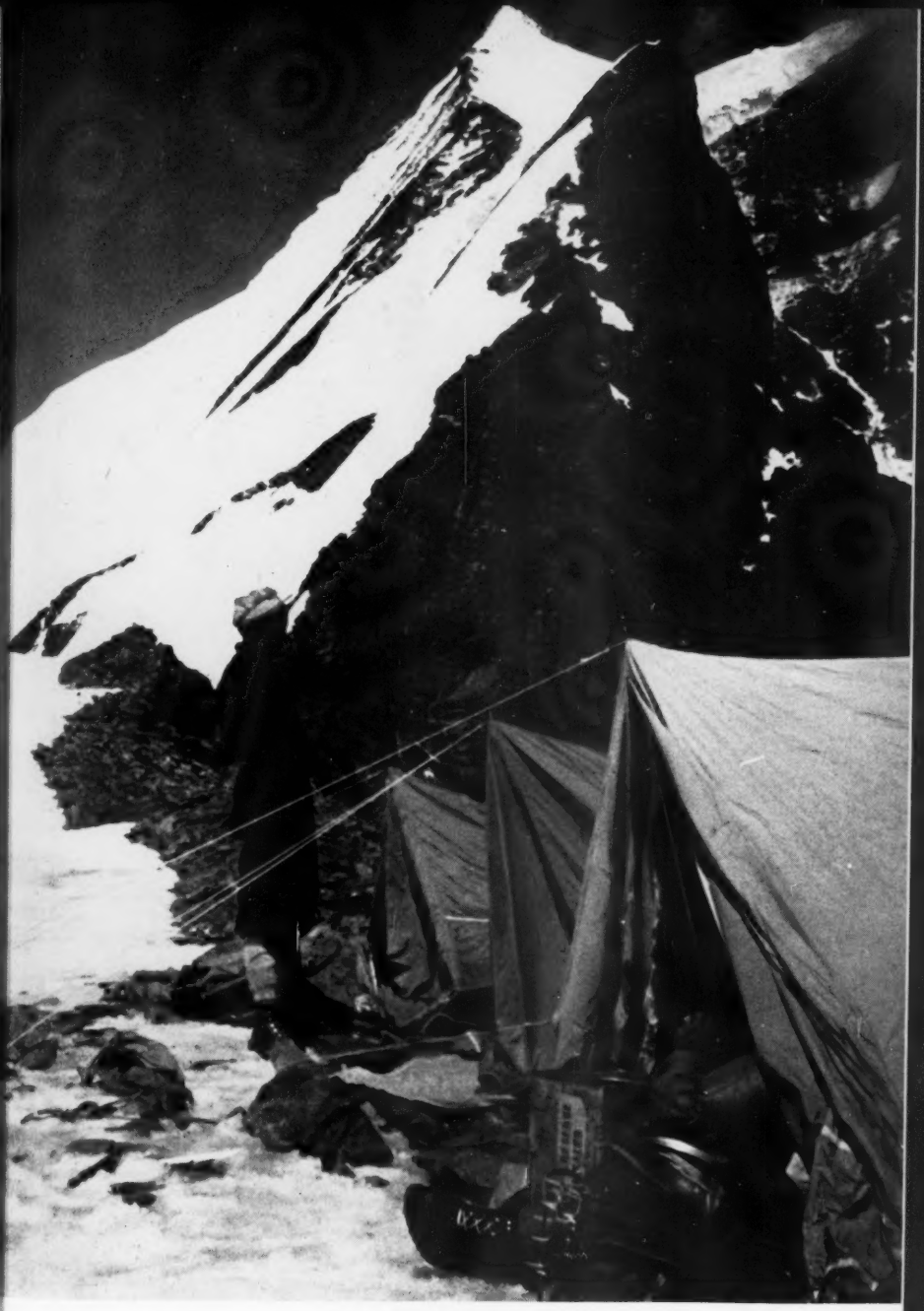
Photo, Nun-Kun Expedition





THE SIRDAR, ANG THARKEY, AND BERNARD PIERRE

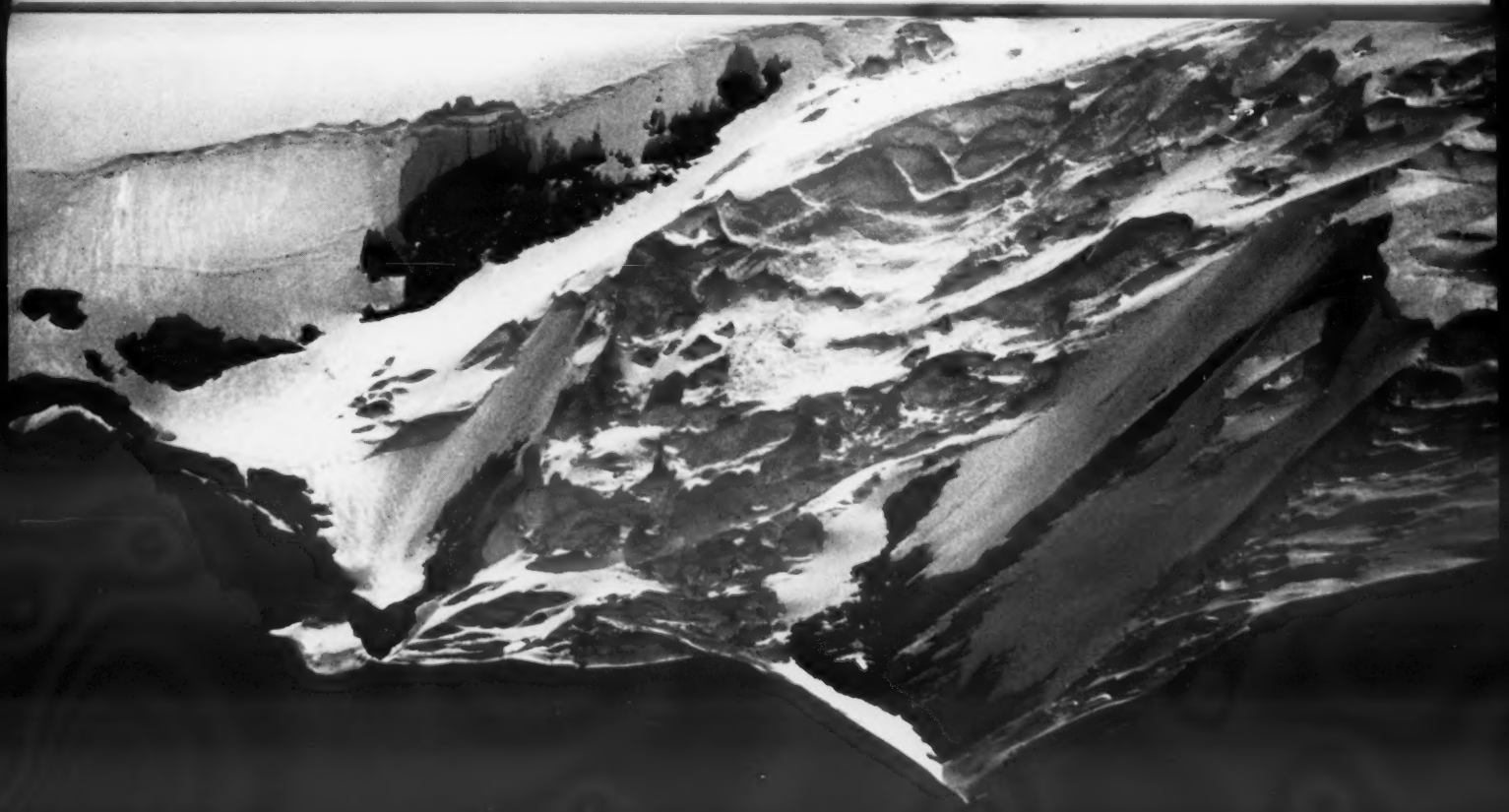
Photo, Nun-Kun Expedition



CAMP I, 18,000 ft., IN THE FOREGROUND

The Tower in the middleground and the summit of the Nun-Kun in the background.

Photo, Nun-Kun Expedition



Pemba Norbu. At 21,600 feet the effects of my accident made it impossible for me to continue without danger of frostbite, so I turned back to Camp III. The three Sherpas from Camp II came up to join us and we watched the summit party slowly traverse diagonally up some 550 yards of an avalanche-prone face to the final ridge. The rope continued painfully along the ridge until, at last, at 2:50 P.M., the summit was won.

By August 31st all camps were removed and our return march brought us to Srinagar on September 9th. Claude Kogan is thus one of the very few women who have ever reached such heights and, more especially, achieved a first ascent of a major Himalayan peak.

Summary of Statistics

ASCENT: Nun, 23,410 ft., Kashmir; first ascent.

PERSONNEL: Leader, Bernard Pierre; Michel Désorbay, Dr. Jean Guillemin, Lt. N. D. Jayal, Capt. K. C. Johorey, Mrs. Claude Kogan, and Pierre Vittoz.

SUMMIT OF THE NUN-KUN (LEFT) AND THE TOWER (RIGHT), seen from the Ganri Glacier.
Photo, Nun-Kun Expedition

Mt. Logan-Cook Expedition, 1953

RICHARD E. McGOWAN

LURED BY some of the fine climbing problems in the St. Elias Range of Alaska and Yukon Territory, Canada, a group of Seattle climbers, in the winter of 1952-53, organized the Mt. Logan-Cook Expedition. Principal objective of the expedition was a new route on 19,850-foot Mt. Logan, highest mountain in the range and second highest on the North American continent. Mt. Logan has been climbed three times by a route on the western flanks of the massif. During the summer of 1952, as a member of the King Peak-Yukon Expedition, I had opportunity to familiarize myself with the southern section of the St. Elias Range. This knowledge, together with photographs by Bradford Washburn, was of great help in planning the expedition. A ridge at the eastern end of Logan, at the headwall of the Hubbard Glacier, appeared to be the only chance for establishing a new route.

Two other mountains were selected as secondary objectives: McArthur Peak, an unclimbed satellite at the eastern end of Mt. Logan, and Mt. Cook, an unclimbed mountain rising above Yakutat Bay. These peaks are, respectively, 14,400 and 13,760 feet.

Five members composed the personnel of the expedition, Tim Kelley, Franz Mohling, Tom Miller, and myself, all members of the Seattle Mountaineers Inc., from Seattle, and Dick Long, a member of the Sierra Club, from Richmond, California. To carry out aerial support for the expedition we engaged Mr. John Merriman, a bush pilot at Yakutat, assisted by William Niendorff of Seattle.

Supplies were shipped to Yakutat in April, to await our arrival

early in the summer. On June 15th Long and Mohling arrived at Yakutat, followed by Miller and me on June 22nd and Kelley on June 26th. A small two-way radio set, to be sent to Yakutat, did not turn up there. Another was ordered in Seattle, to be parachuted after we were back in the mountains.

We spent the first week at Yakutat airdropping the 2200 pounds of supplies at the six drop sites. Drops were located at the bases of the three peaks and at three points along the route in which we were to hike over, making the 85-mile stretch to McArthur peak a pleasant trip. Approximately 250 pounds of supplies could be carried on each flight back into the range. For the drops a Super-Cruiser plane was used. All drops were free-fall, about 25 feet over the glacier. Opportunity was taken on these flights for reconnoitering the routes.

On June 29th we were landed on the beach, on the north side of Yakutat Bay. For the first 25 miles we hiked over the Malaspina Glacier to Seward Rock, then 45 miles across the beautiful Seward Glacier to Water Pass, lying on the ridge between Mt. Logan and Mt. Vancouver. On July 4th we dropped down the north slopes of Water Pass onto the Hubbard Glacier. Traveling westward up the glacier, we reached the base of McArthur Pass between the east ridge of McArthur Peak and a 12,200-foot peak to the east. On the summit of the pass we were at the head of the Logan Glacier. Five miles of easy downhill travel brought us to the base of the north ridge of McArthur Peak. Our airdrop was recovered in perfect condition. Six days had brought us over 85 miles of beautiful glaciated country, probably the first such expedition making an approach to the interior from the ocean.

On the morning of July 5th Miller and Mohling elected to remain at base camp to await the arrival of the plane with the radio, while Long, Kelley, and I set off up the north ridge to establish Camp 1. We encountered moderately difficult snow slopes between 7300 and 9000 feet. Above 9000 feet the ridge became narrow and exposed, making step-chopping necessary. Late in the afternoon Camp 1 was established at 10,800 feet. Above camp a 45° snow slope rises to 11,800 feet, where a ridge begins and runs steeply upward to 12,500 feet. Above this eleva-

tion begins the crux of the climb. A large rock promontory rises from the ridge to a plateau glacier leading to the final summit pyramid. An ice-filled couloir, in the center of the rock promontory, looked like the only feasible route over the obstacle. Overhanging ice and steep slopes made traversing it impossible.

Miller and Mohling arrived next morning with the news we were without communication. The parachute containing the radio had failed to open. This proved very awkward because Long had awakened this same morning with every sign of appendicitis. We discussed his condition and decided we must get him down to base camp as soon as possible. He was very weak but able to walk, so all the way down the ridge Kelley supported Long with the help of two men belaying them and the last man acting as an anchor.

Once at base camp, we began to give Long chloromycetin. Attempts were then made to reach the beach and signal with fires for help. This proved impossible because of a severe storm which blanketed the area. The only thing left to do was to stamp letters in the snow "APPENDIX—10 RESCUE" and await the return of Merriman. The storm lasted four days. On the fifth day Merriman flew over, saw our distress signals, and notified 10th Air Search and Rescue. On July 11th, 10th Rescue flew over, dropping a radio set to use in communicating with a doctor on board the plane. The doctor confirmed our diagnosis. Because of the elevation they were unable to land the Albatross, so Merriman returned and picked up Long. We were relieved to know that he would soon be under medical care.

On July 15th the weather cleared just enough to return to Camp 1 on McArthur Peak. Another storm was brewing, so we decided to attempt the summit the same day. At the rock promontory we were unable to push a route over it before being overtaken by the rapidly rising clouds, so we climbed down to Camp 1. The storm continued the next four days. Several times we tried to push the route higher on the mountain, but never succeeded in getting above the rock promontory. During this time we used up what little food there was left. Finally, with the storm still raging, we returned to base camp.

There we were faced with a very difficult decision. Should we

travel 15 miles to the Logan airdrop, pick up food, and return to finish the climb of McArthur or make a reconnaissance on Logan's east ridge and leave a cache which could be used on a future expedition? We decided on the latter because time was running short, the weather was unusually poor, our manpower was down to four, we had no communication, and a reconnaissance of the east ridge would greatly improve the chances for success of any future expeditions.

On July 21st, we reached the Logan airdrop. Above the drop rose the east ridge. There was no practical route onto the ridge on the north side because of the 60° ice slopes; therefore difficult rock was climbed at the end of the ridge. Once on the ridge, July 22nd, ropes were dropped down the 60° ice slope and supplies were hauled up, using a pulley system. A cache was made in the rocks. Two days later we continued our reconnaissance up to 10,200 feet. At that elevation we found the ridge very narrow, exposed, and dangerous because of loose rock (granite diorite). Between 10,200 and 13,000 feet there appears to be moderately difficult rock and ice climbing. Above 13,000 feet there is probably very difficult ice climbing on slopes up to 65°. At 15,500 feet there is a plateau glacier leading to the east summit, approximately 19,700 feet. An ascent of the ridge will involve a tremendous supply problem, along with technical rock and ice climbing. Following the reconnaissance we returned to base camp.

Several days' easy sledding down the Hubbard Glacier to Water Pass, then across the Seward Glacier, brought us to the north face of Mt. Cook. Our airdrop, which had been lying on the glacier for about a month, was in perfect condition. All the bundles were accounted for, making all the drops 100 per cent efficient for the summer. The five gallon metal cans in which the food was packed proved to be unbeatable.

The Base camp was located between the summits of Mt. Cook and Mt. Vancouver to the north, which marks the International Boundary between Alaska and Yukon Territory. We therefore named it "Boundary Camp." We arranged camp as we had so many times during the summer. Our nylon tarp was laid out, covered with snow to melt; the tent was pitched to give a maximum view from the door, and the food was arranged according

to variety. Miller and Mohling were snapping one picture after another of the mountains, as Kelley glumly looked over the food supply for something new.

Above camp the sharp-pointed summit of Cook was plainly visible. A ridge led northeast from the summit to a col at 10,000 feet. The northwest slopes of this col led down to an immense amphitheater directly behind camp. The glacier which emerged from this cirque was as complex as any imaginable. Crevasses ran in patterns like those of a checkerboard. In order to get up to the col, we had first to find a route back into the amphitheater.

For two days we crawled in, out, and around crevasses, searching for a route. Finally, two of the party were able to place a route back to the less broken section of the glacier at the base of the slope leading to the col. On July 31st Camp 1 was set up at an elevation of about 8500 feet in the center of the amphitheater. All about us avalanches poured out onto the glacier floor, even from the slope we would soon have to climb.

We were not surprised to find the weather fast closing in on us the morning of August 1st. Apprehensive lest we be driven off another mountain, we needed little urging to pack and start up the avalanche slope leading to the col. We couldn't have planned the timing better, for when we reached the base of the slope the temperature was well below freezing. We found the snow frozen hard enough to reduce the avalanche danger, but not hard enough to provide an unbreakable crust for the two heavy climbers, Mohling and Kelley.

At 8 A.M. we reached the col, elevation 10,000 feet. Southward the wind was sweeping a sea of clouds toward us. Past experience reminded us we would have only a few hours before being engulfed in mist. Having only two days food with us, not enough to

Top—AERIAL VIEW OF MT. COOK, showing the route on the north side. The X's mark the Base Camp, Camp I, and Camp II.
Photo, Franz Mohling

Bottom—MT. LOGAN, 19,850, FT., rising above the Seward Glacier. The east ridge and east summit are on the right. Note magnesium sled used by expedition.
Photo, T. Miller

EAST RIDGE OF MT. LOGAN

rising from the Hubbard Glacier. Spot at 16,200 feet indicates highest point reached on reconnaissance of a tentative route.

Photo, Franz Mohling

wait out a protracted storm, we decided to make our summit attempt immediately.

We climbed the snow slopes directly above the col, encountering numerous bergschrunds, none offering any problems. The soft snow made progress tiresome, and we were much relieved to reach the hard, wind-packed snow on the ridge. From the point where we gained the ridge to another several hundred feet below the summit we moved without encountering any problems. The final steep slopes on the summit pyramid made good steps necessary. At 4 P.M. we reached the summit. We stood in a thick mist, unable to see past a sub-summit to the south. After a few moments of careful observation, we agreed that we were on the higher of the two summits and sat down to enjoy our victory. The snow driven into our faces by a strong wind soon made us pack and descend to the more protected north slopes. Several hours of descent in soft snow brought us to Camp 2.

The weather was fast deteriorating. Below, the Seward Glacier was covered with fog, and mantle clouds billowed from the summits of Mt. Augusta and Mt. St. Elias to the west. The warmer weather would endanger our chance of having safe travel conditions on the avalanche slope below Camp 2, so we waited at Camp 2 until 5 A.M., August 2nd, before descending to Camp 1. From there we continued on to Base camp, arriving later that day.

On August 3rd we began the 60-mile journey to the ocean. Rain, fog, and poor visibility made the trip a most uncomfortable one. When we reached the beach on August 9th we didn't have a piece of dry clothing among us. The preceding six days had been too much for even waterproof articles. To add to our misery, a cache of food left on the beach was stolen, apparently by fishermen. We were reduced to a diet of wild peas for three days. On August 12th we were picked up by Merriman. Dr. Robert Sharp, geologist studying the Malaspina Glacier, had spotted us earlier that day while attempting to air drop supplies at his camp on the Malaspina Glacier.

At Yakutat Mrs. John Merriman provided a wonderful ham dinner with all the trimmings, a welcome treat after 46 days of

concentrated foods. Still in the rain, we boarded an airline plane on August 14th for the return to Seattle.

The summer had been a most enjoyable one for all of us, even for Dick Long, who had spent only a few days in the range before having to be evacuated to Yakutat with appendicitis. Lack of manpower, poor weather, and no communication had made it necessary to discontinue our full-scale attempts on McArthur Peak and the east ridge of Mt. Logan, but we had accomplished a first ascent of Mt. Cook. Perhaps our most important achievement was the reconnaissance of Mt. Logan. We hope that future expeditions will find this valuable in their attempts.

Summary of Statistics

ASCENT: Mt. Cook, 13,760 ft., St. Elias Range, Alaska; first ascent.

PERSONNEL: Leader, Richard McGowan; T. Kelley, Richard Long, Thomas Miller, and Franz Mohling.

Climbing and Exploration in the Northern Purcells

ROBERT C. WEST, JR. and PETER ROBINSON

I. Spillimacheen and Carbonate Ranges

In the summer of 1952, looking southeast into the Purcells from Mt. Sir Donald in the Selkirks, we noticed some attractive-looking peaks projecting from a high snowfield. When we later found that the area was practically virgin territory for mountaineering—and, better still, that a road was rumored to run from the Columbia River to within striking distance of the peaks—the idea of a Harvard Mountaineering Club expedition to the Purcells was a logical result.

August 10th found four of us, Winslow Briggs, John Humphreys, Peter Ray, and myself, on our way into the Purcells, at last, in "Bessie," my veteran 1938 Chevrolet. The road leading westward from Parson Station deteriorated rapidly, and the last 20 miles were a muddy horror, especially for the owner of the car. Fortunately, we had to be pulled out only once, by a jeep belonging to two friendly lumbermen. We arrived thankfully at the end of the road after four hours, having driven just 28 miles! Here there were several lumber camps, where spruce logs and lodgepole pine were being cut and floated down the Spillimacheen and Columbia Rivers to lumber mills at Parson.

After dividing our equipment and supplies for two weeks into four 65-pound packloads, we started off to the Spillimacheen Range. The trail up McMurdo Creek follows a jeep road constructed only a few years ago but now impassable to vehicles, which leads gradually uphill through beautiful forests of spruce and fir. From occasional clearings we could identify the three western Spillimacheen peaks which were to be our first climbing

objectives. After about seven miles we reached the abandoned lead-silver mine of the Beverly Company at the headwaters of McMurdo Creek. The next half mile provided the only really unpleasant going on our pack trip, as we struggled up through alder growing in the steep bed of the stream which drains the Spillimacheen Glacier. At last we located a suitable spot for base camp, a small sheltered gravel flat on an old medial moraine, about a mile from the present terminus of the glacier.

Since we had labored to place our camp high, we allowed ourselves the luxury of late starts. We left camp the next morning at 8:45 and walked up the medial moraine to the cirque basin below the Spillimacheen Glacier. We then climbed up a snow tongue between the bands of cliffs which nearly surround the basin and out onto the glacier itself. The route up the névé to the col between Cony and David[1] Peaks presented no difficulties. One rock pitch brought us to the easy western snow ridge of Cony Peak, which we followed to the summit, arriving at 1:30 P.M. We found the cairn built by Wexler's party, who first climbed the mountain in 1947[2], but the cony for whom the peak was named was not in evidence.

From the summit we could gain a good idea of the geography of the range. The three western and alpine Spillimacheen peaks are all between 9300 and 9400 feet in height, and are quite closely spaced, while four other major summits lie at wider intervals to the east. Although earlier maps indicate that the Purcell divide passes to the west of the range,[3] actually the three western peaks are on the divide, which then circles westward again over some low rocky peaks to the Carbonate Range. Across the deep Purcell trench, which contains the Beaver and Duncan Rivers, we had a superb view of the southern Selkirks. We were

[1] Formerly known derisively as "David's Folly" by McMurdo Creek miners, following the first ascent by David Simpson and Carl Johnson in 1946.

[2] A. Wexler, *Appalachia, 27,* 21 (1948).

[3] J. M. Thorington, *The Purcell Range of British Columbia,* American Alpine Club, New York, 1946.

THE FOUR HIGH PEAKS OF THE CARBONATE RANGE
Unnamed Spire, Horseman Spire, Richards Peak, and Carbonate Mountain.
Photo, P. M. Ray

even more interested, however, in the view to the south, where we could see the high peaks of the Carbonate group, our ultimate objectives. The two eastern peaks were sheer rock spires which looked uncomfortably difficult.

After half an hour we continued down the rocky east ridge of Cony Peak, over two conspicuous gendarmes, and up easy rock to the westernmost peak of the range. This summit comprises two towers of almost equal height, which suggested our name of "Twin Towers Peak." We reached the western and highest tower 50 minutes after leaving the summit of Cony. Although this peak may have been traversed by David Simpson when he climbed Cony Peak in 1947, we found no sign of a previous ascent. We climbed down a steep rock buttress to the glacier and picked our way carefully across a series of wide crevasses, eventually rejoining our route of ascent. Returning to camp required three hours.

Our plan for the next day was to climb David Peak, third and highest of the western Spillimacheen peaks, as further conditioning for our trip into the Carbonate Range. Instead of reaching the glacier by the snow tongue which we used the day before, we spent an hour forcing a route up the cliffs just below David Peak. Once on the glacier we rapidly reached the Cony–David col, and one rock lead brought us to the grassy ledges of the west ridge. Soon the ridge steepened, and the grass gave way first to shattered broken rock and then to cliffs. John led the final two nearly vertical pitches to the narrow summit, which we reached three and a half hours after leaving camp. Following a typical lunch of Ry-Krisp, jam, apricots, and chocolate, we returned to the col by the same route. Win and Pete now decided to traverse below David Peak to the snow-covered pass on the east, to search for a feasible route over to the Carbonate Range, while John and I crossed the glacier and prospected pack routes along the eastern edge. The others arrived in camp an hour behind us, optimistic about the route into the Bobbie Burns valley.

We left camp the next morning carrying 45-pound packs, after

RICHARDS PEAK AND CARBONATE MOUNTAIN
from the arête leading to the upper Carbonate Glacier.
Photo, P. M. Ray

carefully caching our extra supplies to keep them out of reach of the persistent ground squirrels. We followed the east lateral moraines of the Spillimacheen Glacier and eventually went out onto the glacier itself, well above the névé line. Thanks to the route-finding done by Win and Pete on the previous day, we felt safe in travelling unroped up the long, gently curving "interminable snowfield." The névé led us just below a fortresslike formation east of David Peak, which we dubbed "The Castle." The sky was crystal clear and absolutely cloudless, and we were in high spirits as we studied possible climbing routes in the Carbonate Range.

Crossing a band of low cliffs, we entered a region of beautiful alpine meadows. We angled westward for as long as possible and even struck straight down the steep wall of the U-shaped valley, through dense spruce and alder. We were happy to see roaring little Bobbie Burns Creek, until we realized that we would have to ford the icy waters, using the rope for a belay.

The valley contains a perfect valley-ring recessional moraine, now more than a mile from the nearest ice, bearing trees which appeared to be at least 40 years old. We climbed up the south side of the valley, near this moraine, to an extensive plateau about a thousand feet above the creek, which provided a perfect campsite for climbs in the Carbonate Range. The Plateau is about at timberline and supports only a few dwarf alpine firs and whitebark pines, along with much heath.

The immediate problem—we had noted from the other side of the valley—was to gain access to the Upper Carbonate Glacier. This high névé was protected by cliffs on the northeast. The long north side ended in four 1500-foot icefalls, interspersed with more sheer cliffs; the western flank consisted of a large and active vertical icefall, where the Upper Carbonate Glacier was breaking off in large chunks to become the Lower Carbonate Glacier. On the southwest was the rock ridge of the westernmost high peak, a very dubious route. The only break in these formidable defenses was a narrow arête leading up to the northwest corner of the glacier. The plateau campsite lay just below this arête, and as Win and John established camp, Pete and I scouted a route up onto the arête and part way up toward the glacier.

Several large gendarmes had appeared from below as possible difficulties, but we were happy to find that they were provided with broad ledges; as Pete put it, they "moved aside as we came to them." But some hundreds of feet of the route up to the glacier still remained hidden from view.

We spent much of the evening discussing whether or not our proposed route would "go"; and when the next morning dawned again clear and cloudless, we seized the opportunity to settle the argument. We rapidly retraced the route that Pete and I had taken the day before. From the arête the view of the four high Carbonate peaks was striking, but even more impressive were the icefalls on the north side of the Upper Carbonate Glacier. Though no longer very active, these icefalls are unusual in height for this area. Far below us, we could see that the icefalls again coalesce into a waning valley glacier.

As we had hoped, the arête offered easy climbing all the way to the upper glacier. Here it was necessary to cross a small intensely-crevassed area, which snapped ominously under us. We then tramped across the névé to the west ridge of the westernmost peak, which we were now sure was Carbonate Mountain itself, the highest in the range. The snow on the ridge was crusted hard and required step-cutting, so we soon gave it up in favor of the easy broken rock. We raced to the summit, reaching the top just three and a half hours after leaving camp. The climb is absurdly easy. Except for the crevassed area where we got on to the glacier, it could all be done unroped.

We spent almost two hours on the summit, taking pictures, admiring the views, eating lunch, building a "colossal" cairn, and relaxing in the glorious sunshine. Not a cloud was in sight, even over the usually stormy Selkirks. The Selkirk mountain group southeast of the Battle Range, which Wexler and Hendricks named "Mt. Nemo," appeared from here to be a massif of considerable size, including several fine peaks. To the north and east, hundreds of peaks were visible in the main chain of the rockies. To the south, we could see clearly the Bobbie Burns and Bugaboo Ranges, and the intervening wilderness of lower peaks, at that time completely unexplored.

Finally, almost reluctantly, we left the summit and went back

down the ridge to the névé. We then traversed the glacier below Carbonate Mountain to the adjoining peak, which was the second highest in the Range. Passing by the steep snow of the face, we started up a promising-looking rock buttress. Here the climbing became more challenging, requiring occasional belays. The buttress eventually intersected the main summit ridge, and we had several good leads over sound quartzite to the summit. We reached the top just two hours after leaving the higher peak. We decided to name this second summit of the Carbonate Range "Richards Peak" for Dr. and Mrs. I. A. Richards who, with the guide Conrad Kain, were the first to venture into the Bobbie Burns group to the south. From measurements with a spirit level, we estimated the height of Richards Peak as 10,050 feet and that of Carbonate Mountain as 10,200 feet. These are the northernmost Purcell summits to attain 10,000 feet; between the Carbonate group and Mt. Conrad in the Bobbie Burns range, only one peak, a fine wedge-shaped summit, rises to this height. Each of the two spires east of Richards Peak appeared to be about 9850 feet.

We spent the next several hours in a fruitless attempt to find an alternate route onto the glacier from the east ridge of Richards Peak. The ridge is quite steep and heavily corniced, and we traversed two minor summits to the east without locating a safe route of descent. In the end we were forced to climb back almost to the summit of Richards and back down the rock buttress again. Once on the glacier we returned rapidly to camp, elated at our easy success with the two principal peaks of the range.

When the weather still held the next day, we decided to try the spires at the eastern end of the upper glacier. Reaching the glacier by the same route, we plodded across the névé in the warm morning sun. At the corniced col between the two spires, we decided to turn to the right toward the nearer of the two, over very rotten rock which required careful roped climbing. The rock soon improved and the angle increased to near vertical.

DAVID PEAK
from Silent Pass.
Photo, P. M. Ray

We had brought sneakers along for just this sort of climbing; so after leaving our boots, we continued upward, John Humphreys and Win Briggs each leading a rope. One quite difficult lead ended at an airy knife-edged belay position. In turn we straddled the knife edge, each leg pointing to different parts of the glacier, 500 feet below! One exposed lead from this point brought us to the tiny summit platform, just large enough to hold four of us at one time. We immortalized the spectacular belay position by naming the peak "Horseman Spire."

The climb had required five and a half hours. We had lunch on top and then headed down, negotiating the most difficult pitch with the use of a rappel. Our initial enthusiasm for high-class rock climbing had temporarily abated, and since it was getting late we decided to leave the other spire, which looked even more difficult, for the next climbers to visit the Carbonate peaks. We returned rapidly over the glacier and down to a low point on the arête, where we slithered down a steep talus slope to explore the Lower Carbonate Glacier. We walked across the glacier to examine a possible route on to the west ridge of "Battlement Mountain," a 9600-foot summit rising steeply from the lower glacier.

The next morning provided the only bad weather of our expedition. Rain kept us in our tents until noon, when we ventured out to attempt the route we had prospected the day before on Battlement Mountain. The snow close to the mountain became increasingly steep, and the last few hundred feet across to the rocky ridge were very steep indeed. We breathed a premature sigh of relief when we all reached the ridge. The rock appeared fairly rotten, and Win sent down a shower of small stones as he led upward. Since my memory of the next incidents are hazy, the narrative is continued by Winslow Briggs:

"I was climbing about 20 feet above the others, having warned them that the rock was loose, and waited for them to get out of the line of fall. Bob was actually under an overhang, some distance to the right. Apparently spontaneously, a piece of the un-

DAVID AND CONY PEAKS
from Twin Towers Peak.
Photo, P. M. Ray

der side of the overhang came off and struck Bob on the head, causing a scalp wound and a possible concussion. I remained where I was, on a rather unstable ledge, while Pete and John bound up Bob's head as best they could. The problem then was to get Bob, who was in a dazed condition, across a bergschrund and up about 300 yards of very sharp-angled snow. Pete led up the slope, and, as Bob was able to walk, John followed Bob very closely up to Pete's belay spots, so that Bob was effectively belayed from above and below. As soon as they were clear, I was able to get onto the snow, and, much to my relief, off of my precarious perch. We all negotiated the slope without incident and made our way down the glacier to camp. About halfway down, Bob was talking normally; the effects of any concussion had worn off. However, once at camp, we put him to bed, rebandaged his head, and tested his pupil reflexes, which were normal as far as we could see. Actually, his reflexes at the sight of our precious bottle of 'medicinal' bourbon were far too normal. His eyes lit up, and the light was accompanied by a meaningful grin."

The next morning I felt quite recovered, and we decided to pack back across the Spillimacheen Range to base camp. Rather than endure again the unpleasant descent into the Bobbie Burns canyon, we decided to work around to the headwaters of the creek and so stay above timberline. We found a complicated route through the jumble of recently deglaciated rock below the three western peaks of the Carbonate Range. These blocklike peaks, though barely over 9000 feet, are heavily glaciated on their northern slopes and should provide good climbing. After crossing a beautiful alpine garden at the headwaters of Bobbie Burns Creek, we continued around through pleasant grassy alps. High above the creek we were surprised to find the ruins of a long-abandoned miners' cabin. Some samples of galena were lying about, evidently taken from quartz veins in the nearby hills.

We crossed the Spillimacheen Range at the high pass between David Peak and The Castle, taking time out to climb the easy ridge to the top of The Castle and obtaining from there a fine view of the Spillimacheen peaks. Then we headed down the glacier and rejoined our original pack route on the ridge northeast of it. Our return route, though slightly longer, was infinitely the

more pleasant of the two, since it avoided nearly all of the steep scrambling and alderslide.

The next day, our last in the mountains, we split into two parties. Pete and Win went off to Silent Pass, explored the area near the two lakes which are perched on the divide and climbed up the steep grassy ledges of the north slope of Silent Mountain to make the first ascent of this 8500-foot peak. Just west of the summit, on their descent, they traversed a prominent gendarme which they insisted should be called "Noisy Needle." Meanwhile, John and I crossed the ridge northeast of the Spillimacheen Glacier, contoured around the next valley, and climbed the fourth principal peak in the Spillimacheen chain. This easy ascent required only three hours from base camp and was rewarding only for the fine view from the summit ridge. Since the peak overlooks the McMurdo Creek mine, we named it "Beverly Peak" for the company which formerly operated the mine. The elevation was estimated as 9150 feet; the next major peak to the northeast appears about 50 feet higher. Beyond this is the highest peak in the range, a broad summit about 9500 feet high which we named "Corner Peak." The range then swings east to include Spillimacheen Mountain and Byron Peak, which have been surveyed at 9371 and 8810 feet, respectively. These eastern Spillimacheen peaks will provide long, dry easy climbs for anyone caring to attempt them.

The next day, August 19th, we broke camp and packed up our supplies as black clouds boiled up over the mountains to the south. We had our last look at the Spillimacheen peaks as they disappeared behind the storm clouds. The rain caught us and hurried us on our way as we packed out to the car. On the way along the Spillimacheen Road, we met the Dartmouth party coming in and stopped to wish them luck with their traverse before we drove the last few miles out to civilization.

R. C. W., JR.

II. A High-Level Traverse

When seen from peaks in the Bugaboo Group Mt. Conrad stands to the northwest, a great conical peak at the center of a

large system of tumbling glaciers. Its bulk is so great that it completely obscures the country on the far side, except well to the right where peaks of the Carbonate Range stand out prominently. Dr. J. M. Thorington originally thought that Mt. Conrad rested within the bend of Vowell Creek, east of the divide. When in 1952 it was proved that the mountain is actually on the divide, it became important to trace the divide northwestward even as far as the Spillimacheen Group, in order to tie in with the Glacier Park Map.

In September 1933 Mr. and Mrs. I. A. Richards with Conrad Kain made the first and only ascent of Mt. Conrad. It was not surprising (as we found out later) that they were confused and came back with no report on the country beyond. More recently the Spillimacheen Group was visited by David Hope Simpson, and in 1948 by Arnold Wexler, Sterling Hendricks, and their party. Wexler gave us the only clues to the country which lies south of the Spillimacheen Group. From Mt. Conrad to the Spillimacheen Range, a vast tract of high country along the divide remained completely untouched by mountaineers. This was the last large unknown portion of the Purcell watershed.

About one-fourth of the distance southward from the Spillimacheen Range, on the upper reaches of Vermont Creek, there is an old mine which was supposedly connected by road to Parson on the Columbia. After due consideration several members of the Dartmouth Mountaineering Club concluded that a high-level traverse would be the best way to explore the country from the mine southward to the Bugaboos. Such a traverse is an old tradition in the European Alps where huts are plentiful. In the 1920's Dr. J. M. Thorington outlined a high-level route from Jasper to Banff in the Canadian Rockies and covered several sections of the traverse himself. Since the war Wexler, Hendricks, and others have made several successful traverses, not only in the Canadian Rockies but in the Selkirks. In fact, it was at the beginning of a high-level trip through the southern Selkirks that they passed through the Spillimacheen Group.

Previously the exploration of the Purcells had been mostly carried out through the use of pack trains in the long fairly open eastern valleys. However, A. A. McCoubrey and his companions

had several times battled their way up the west side of the Purcells from Kootenay Lake, carrying everything on their backs.

Dr. Thorington, who with Conrad Kain had "opened up" the Southern Purcells in the years 1928, 1930, and 1931, and to whom we owe most of our present knowledge of the divide, provided funds for aerial photographs to supplement those we already had of the Bugaboo area. Without the use of this modern innovation for route finding, our traverse would have been virtually impossible in the time available. Arnold Wexler was also kind enough to send pictures taken from the Spillimacheen Group.

It was our good fortune at this time to learn that a Harvard Mountaineering Club group under the leadership of Robert West had secured additional aerial photographs and planned exploration of the Spillimacheen Range and an attempt on Carbonate Mountain. Since our two programs meshed so closely, we agreed to combine our new-found knowledge in a single map of the last section of the divide.

During the early part of last summer, scattered members of the expedition worked on food and equipment problems. Besides using standard grocery store items (dehydrated), enough for 16 days (about 3600 calories per day) and to be supplemented with vitamin pills, we developed our own innovation "mung," a powdered form of hardtack, which can be mixed with water to make "mung balls." Not only is "mung" very filling, but it is 80% smaller in volume than hardtack and a powerful deterrent to indigestion. We carried two two-man tents, a primus stove, and two quarts of gasoline for high-altitude camps.

THE FOREST TREK

At Spillimacheen on August 18th Fen Riley, Gene White and I were joined by Rob Day and Bob Brooke from St. Louis, Missouri. The first blow to our plans was to learn that there never had been a truck road to Vermont Creek and that we would have to walk from a point where a trail branches southward from Spillimacheen River. The next morning heavy cirrus clouds moved across the sky heralding the end of a long period of good weather. We hastily loaded Bob's car with our crammed, heavy-

weight packs, and then, wishing luck to a party of Iowa Mountaineers heading up Bugaboo Creek, we started north for Parson, whence a lumber road leads over a low ridge from the Columbia to the Spillimacheen Valley.

I will not burden the reader with a description of our confused wanderings because of misdirections. Coming down on the Spillimacheen River side of the ridge, we burst out of the woods and were surprised by a view of Mt. Sir Donald towering beyond the head of the valley.

Already the sky was filling with thunder clouds. As I dog-trotted along in search of the intersection of our trail, I suddenly blacked out with a comfortable, far-away feeling. A split second later I found myself crouched in the road as the sound of thunder died away. I had received a gash on the knee, a torn pant leg, and I felt as if I had been hit on top of the head with a club. Apparently I had been knocked over by lightning. Later, as Fen was bandaging up my knee, who should come chugging by but Bob West, Win Briggs, John Humphreys, and Pete Ray in Bob's battered '38 Chevy. We listened to the story of their successes.

At last with the kind assistance of some lumbermen we found the trail to Vermont Creek. The road runs for some distance along the crest of an ancient lateral moraine and then takes a sharp bend uphill to the right. At this corner a path leads steeply down to the Spillimacheen River bridge which can be seen a hundred feet below. It began to drizzle at 3:45 P.M. as we hoisted on our 80-pound loads and started for the wooded divide between the Spillimacheen River (North Fork) and its South Fork, Bobbie Burns Creek. At first we could only walk ten minutes for every two minutes rest, but gradually we increased the walking time. The rain soon ceased and the sun occasionally broke through the clouds as we wound our way gradually upward through the lush virgin forest of towering Douglas firs.

At 7:00 we reached an old trappers' cabin on the divide. A short side trail leads eastward to a moose swamp on the margin of Summit Lake. We pushed on down the Bobbie Burns slope and camped just after dark at the first source of water.

In the morning there began a series of intermittent rains

which lasted for the next two days. Not far beyond Camp I we came to a fork in the trail. The right-hand branch of it runs westward up the northern side of Bobbie Burns Creek to its headwaters on the north side of Carbonate Mountain. The left trail, which we took, leads southwestward across the valley of Bobbie Burns Creek and across a low angle to Vowell Creek, whose magnificent gorge enters from the south at this point.

As we came nearer to the Bobbie Burns crossing, the windfalls cost us a great deal of effort, there often being a tree every ten or fifteen feet for a 100 yards at a time. Finally the crossing over the raging torrent was reached and we were delighted to find facilities which called to mind the Himalayas. Two long logs tied together with wire formed a footbridge and nearby was a heavy wire with a trolley hook to bring the packs across.

Between rainstorms the sun came out periodically as we pushed on up the west side of Vowell Creek through more bad windfalls, shoulder-high bushes, some open country, and finally up a very long hill into the hanging valley of Vermont Creek. Along the way we had an occasional glimpse of the icefalls of a huge glacier many miles to the south which could be none other than the Conrad Icefield. Vowell Creek, because of the great number and extent of glaciers at its head, carries about twice as much water as either Bobbie Burns Creek or Spillimacheen River.

At 8:30 P.M., exhausted and soaking wet, we waded across the upper part of Vermont Creek to the luxurious old cabin on the south side. In a short time the little wood stove was glowing red and Gene pronounced it a "bloomin' paradise."

HIGH COUNTRY

The following afternoon we started off with a relay load in rainy weather. A short tussle with wet bush led to a long traverse on shale slopes below the great cliffs on the south side of the valley. The waters of Vermont Creek curved down from the north, but by heading due west and climbing up a 500-foot headwall we reached the bank of a glacier which drains to the north fork of Crystalline Creek. An hour's climb up the gently sloping ice brought us to the névé, where we turned southward and

reached the easternmost of two easy passes in a rotten east—west ridge.

To the south was revealed a great array of unknown mountains tormented by ragged windblown clouds. For the first time I began to understand the true meaning of Thorington's statement that the Purcells had an atmosphere not unlike the misty Isle of Skye. Caching the contents of our packs and christening our pass "Cold Shiver Col," we hastened back to the "flesh pots" of our "Vermont Creek Hotel."

1:00 P.M. the next day found us back on the névé with the rest of our duffle in better weather. Depositing our loads and polishing off lunch, we turned northward up a small icefall to a higher névé which leads to a dark helmet-shaped peak of rotten rock. A few short rock pitches up to the south ridge and up to the southeast face brought us to the upper rubble slope. After much slipping and sliding, we emerged on to the beautiful snow crest of the south summit and a few minutes later scrambled up the rocks of the highest point to the north (ca. 9600 feet).

We were pleased with our conquest, for this was our first opportunity to get a comprehensive view. Fortunately the clouds were high and we could even see Bugaboo Spire looming in the southeast, although Mt. Conrad was heavily wrapped in cloud. Mt. Nemo and hoards of unknown peaks were seen across the Duncan in the Selkirks, while the southern escarpment of the Carbonate Range rose above us to the northwest. It was Mt. Nemo which gave us the idea of naming our peak "Mt. Syphax" for the villain of another Jules Verne story. Mt. Syphax is an important point on the divide in that it drains to no less than four different creeks.

At the southwest corner of the glacier we had come up rose a great serrated prism of rotten rock at least 200 feet higher than Syphax. We felt some chagrin at not having climbed it instead, so we decided to spend the next day in its conquest. Beyond lay a jumble of ice-laden peaks dominated by a towering white truncated cone certainly above 10,000 feet.

Our stay on the summit was none too long, for Fen and I felt colds coming on and we still had to pick up our cache at "Cold Shiver Col" and get down to a camp in the Valley of the

Lakes. At 6:00 P.M. we arrived at the cache and began to load on the additional supplies. Once in the valley below the col on the south side, we had a minor north-south ridge to cross to reach the Valley of the Lakes. We experienced great difficulty and danger getting up the rotten east side of this ridge. Future parties should therefore take the more westerly of the two cols, which, though higher, makes possible a route directly into the Valley of the Lakes. Pitching camp on the first patch of grass high above the lakes, we settled down to cooking supper over the primus by moonlight.

Next morning at 9:15 A.M. (August 23rd) found us at the western col below the great prism peak after a rainy night at Camp III, 15 minutes below. Mist obscured all the peak except the nearby southeast tower, but after a short discussion we kicked up a very steep snow slope onto the rotten rocks. The next four hours took us all over the mountain on the only feasible line of attack: Up the east face of the southeast tower, traverse northward (right) below the summit block of the tower into the notch, traverse from the notch westward (left) to south end of the great southwest talus bench, up the talus (east) to the narrow but solid south summit ridge. An exposed traverse across the east face to get around a high tower brought us to a deep notch in the summit ridge. Since the tower was unclimbable, I continued northward up a chimney to a minor peak beyond which rose another high tower. Bob made a fine lead up a vertical crack which at the top turned into a tunnel and emerged on the official summit, which is about the same height as the unclimbable tower. The nearly perpetual cloud blowing over the summit suggested the name Mont Brouillard. Not long after the other three had arrived by a slightly different route, and after we had built a cairn, we began the descent, for there had been several sleet storms and now there were distant rumblings in the west.

Back at Camp III at 4:30 we stuffed down a quick lunch and scuttled for the tents as a heavy shower began. At 8:00 the rain ceased and we got up to cook supper.

As dawn approached on August 24th, the sound of rain on the walls of the tent changed to that of sleet, then snow. Before long enormous snowflakes were falling in a continuous shower,

blanketing the ground and cutting visibility to a few feet. Fortunately at 9 o'clock the snow stopped falling and visibility improved. As we found out many times on this trip, nothing whets enthusiasm and stimulates energy more than coming out into the open from a cramped tent and a soggy sleeping bag. Fen and I were out first and our oh's and ah's on seeing the marvelous wintry scene brought the others.

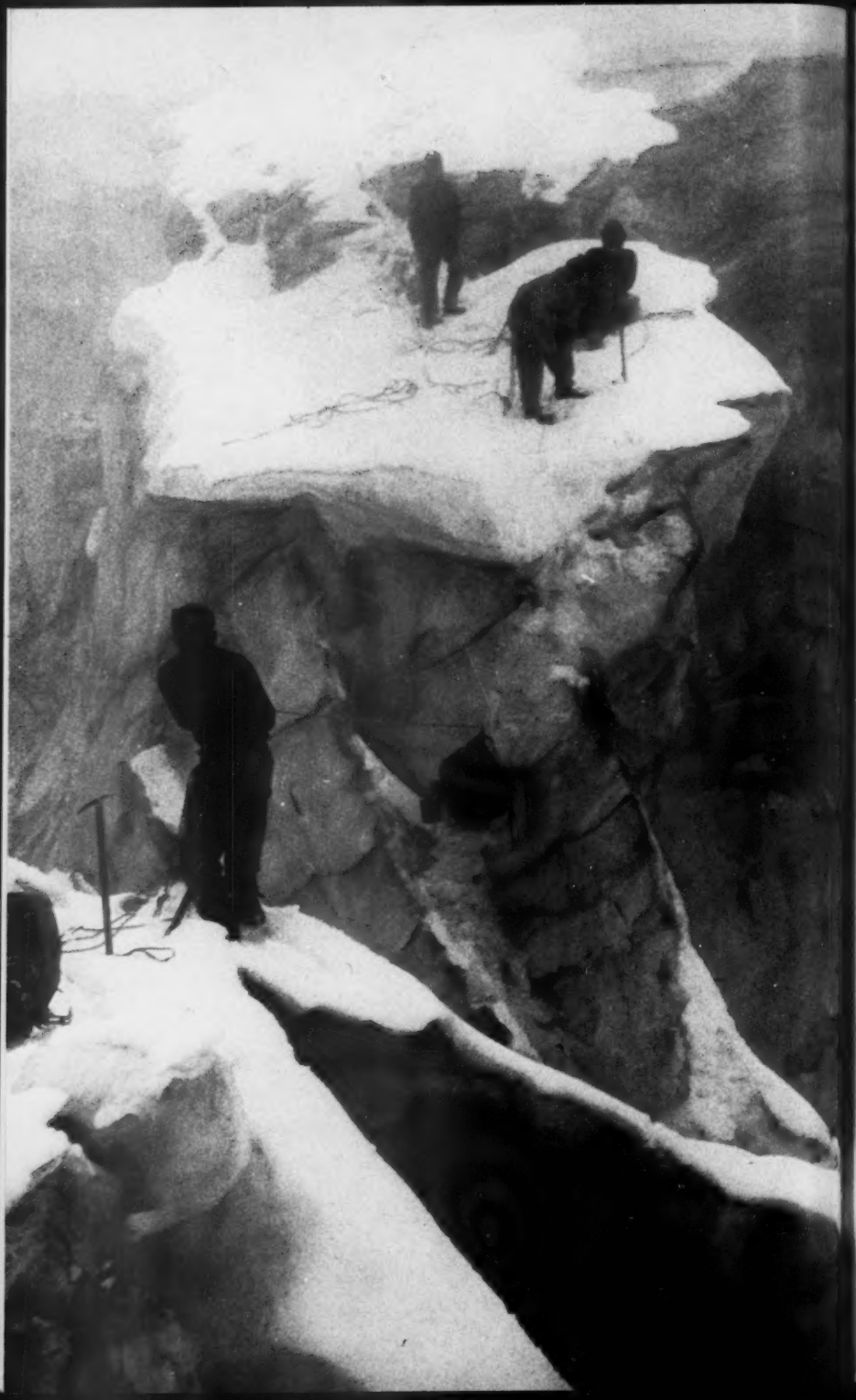
There was some talk of retreat, but the memory of the windfalls urged us to go on with the traverse and see if the weather would improve. Fen pointed out to our satisfaction that "great explorers" have always had to overcome serious difficulties in terrible weather, and with this as an inspiration we started down into the Valley of the Lakes with full loads.

In a few minutes we were down below the level of snowfall and a steady rain began which lasted the entire day. We were sorry not to have more time to spend wandering about the two large lakes and vast alpine meadows of this wonderful high valley. Without more than a few pauses Fen led us up a long steep snow slope to a pass on the far side of the valley, and we slid down shale to the next high valley. Here the Late Pre-Cambrian rocks of the Windermere Series are thrown into sharp anticlines and synclines which divide the valley lengthwise and form a structural geologist's paradise. We crossed these folds to a lake on the far side and followed the lake stream southward into the valley of the Middle Fork of Crystalline Creek.

Directly across the valley on the south side, the end of a great ridge showed through the mist and a 1000-foot cascade plunged from a high snowfield to the valley bottom. We hurried on down past timberline to a forest campsite 500 feet above the valley floor. In an hour we had a roaring fire so that we could at least keep warm if not dry. Tents were pitched on thick beds of boughs and we looked forward to a comfortable night despite the rain.

Top—**CAMP III ABOVE THE VALLEY OF THE LAKES after a snowstorm. Unnamed Peak with high pass to right.**
Photo, P. Robinson

Bottom—**CAMP V AND THE PEAKS OF THE CRYSTAL RANGE (1) Unnamed 9800 ft., (2) Cuestaform, and (3) The Steeples.**
Photo. P. Robinson



THE CRYSTAL RANGE

At 9:00 the next morning, after several conflicting weather reports, I decided to see for myself. Outside, the air was distinctly dry, a strong northwest wind was blowing above, and patches of blue appeared off and on. It was time to burn our bridges and get on with the traverse.

By noon we were able to assemble reasonably dry loads and plunge over the wooded precipice en route to the valley bottom. The extreme upper part of the deep east–west valley is terminated by a high-mountain barrier and the stream hooks around to the southwest to drain a glaciated watershed pass above 8000 feet, our next objective. We were sorry to leave the lush grass and flowers of the valley for the icy regions above, but the day was wearing on and this might be our only chance.

The clouds were blowing away gradually, but it was still cold enough to wear all our clothing as we followed Fen's lead up the ice and snow of the glacier. About 3:30 we made a chilly stop on a large boulder to gobble up "mung balls" liberally spread with jam and peanut butter.

The final slope of fresh windpacked powder snow emerged onto a broad saddle and into bright sunlight. Packs were forthwith eased to the ground that we might scamper about and enjoy a wintry panorama such as is rarely seen. The south side of the pass fell away at our feet to the deep valley at the head of Hume Creek which shortly plunged into the Duncan. Beyond were many peaks in the southern Selkirks, both known and unknown. We recognized Mt. Templeman, the Badshot Towers, and Mt. Thtiff. Mont Brouillard, looming up in the north, had lost its old cloud banner and its upper ledges were outlined by wide stripes of white. To the east the snowflecked west flank of the Crystal Range was spread before us with its many high peaks and spectacular hanging glacier. The crux of the entire traverse, a high, difficult pass, the lowest point in the Range, lay due east and 1000 feet above.

Resisting the temptation to stop overnight and attempt the

BRINGING PACKS ACROSS A CREVASSE ON THE FINAL DAY
Photo, P. Robinson

high 10,000-foot truncated cone peak, we pushed up the east side of the saddle and then with some difficulty climbed down to the right to the small glacier which flows from the high col down the West Kootenay slope. From the head of the glacier it took more than an hour of step kicking on steep snow and freshly snow-covered shale to reach the high pass which we called Climax Col. The sun, which had warmed us during the climb, disappeared behind the 10,000-foot cone peak as we pulled ourselves over the last steep ice-feathered rocks to the windswept crest at 7:45 P.M.

On the other side the peaks at the western edge of the Conrad Icefield were bathed in golden light which gradually took on a rosy hue, until only the great north face of a peak southwest of Mt. Conrad (No. 9 on the Thorington map) shone like some distant Himalayan giant. We rushed down the steep eastern slopes of lightly windpacked powder snow in the gathering darkness and reached trees about 8:30. A warm fire held off the evening chill while we cooked a hearty supper. From this perch high on the western side of the South Fork of Crystalline Creek we watched the moonlight play on the icy peaks at the head of the valley.

The morning of August 26th was unique. From a flawless blue sky the rays of the sun gradually moved down into the valley until our camp was removed from the frozen shadows. Slowly our minds and bodies became tuned to the warmth and we emerged from tents and sleeping bags to bask in the sun. We had known the night before that we would not want to attempt a long climb the following day, but at 11:30 we set out for a nearby ice-capped peak in the Crystal Range.

Already, gray storm-front clouds were moving in from the southwest. Long flower-strewn talus slopes led us to the tongue of one of the many steep glaciers of the Crystal Range. Climbing up the ice a few hundred feet, we bore left up a series of westward-dipping bedding planes on the northeast face of the mountain to their intersection with the east ridge. The rotten ridge in turn brought us to the foot of the hanging ice cap which clings to the eastern face and runs up to the very summit where rocks are exposed. It was snowing when we reached the top, but

visibility improved greatly soon after we sat down for lunch on the pile of phyllite bars at the highest point.

The North Peak of Crystal Mountain, as we named it, is about 9700 feet in elevation and is the fourth highest peak in the Crystal Range. The South Peak, a quarter of a mile away across a deep gap, is slightly higher. South of Crystal Mountain are two higher peaks and several lower ones, while north of it is a long, high nondescript ridge broken by Climax Col. A southern extension of the Crystal Range, consisting of less spectacular glaciated peaks, curves around in a broad arc ending in a northwesterly-trending ridge close to the Duncan.

Northwestward we could examine the group of peaks dominated by the 10,000-foot truncated cone which did not seem a great deal higher than we were. At least two of the four or five peaks in the group are probably granite and will make difficult ascents.

At the head of the South Fork of Crystalline Creek is a fairly low pass containing a small lake, which we propose as the division point between the new Crystalline Group and the old Bobbie Burns Group. East of the pass is a high snow-plastered ridge two miles long, like a miniature of the Dawson Range in the Selkirks, with a western tongue of the Conrad Icefield along its northern flank. We named this ridge Mt. Thorington in honor of the patron of our expedition, who during his long association with the guide Conrad Kain brought to light most of our present knowledge of the Purcell Divide and compiled Conrad's memoirs after the latter's death into the stirring autobiography *Where the Clouds Can Go.* Beyond Mt. Thorington is the pure, white symmetrical outline of Mt. Conrad, rising to over 10,000 feet directly from a vast icefield.

Our descent back to Camp V was enlivened by a long glissade down the east snow face. We were able to finish supper just as the inevitable rain began.

In the morning the usual lull in the rainfall allowed us to pack up. We gave up hope of further ascents from this camp and moved in two hours to a comfortable camp in the last tall timber directly below the west tongue of the Conrad Icefield. In the late afternoon Rob and I carried extra food and climbed up

steep talus slopes for 1½ hours in rain and sleet to the northern edge of the icefield tongue. We returned to a cozy little shelter, a warm fire, and supper just before dark. About 10 o'clock the rain stopped and the air became drier. Things looked auspicious for a dry night's sleep and moderate weather for our first day on the Conrad Icefield.

The Conrad Icefield

We had reached a transition point in our journey. Up until this time we had been passing through a country of folded Pre-Cambrian sedimentary rocks which form deep valleys, high jagged mountain ranges, and small, steep glaciers. Travel was comparatively slow because of the many steep passes, vegetation, shale slopes, and the amount of vertical distance necessary for every horizontal mile gained. On Vermont Creek, and on the Middle and South Forks of Crystalline Creek, we saw water-worn canyons in the bedrock 10 to 50 feet deep. Since they are within half a mile of the present glaciers, they would seem to indicate that there has been very little advance or retreat in the last few thousand years.

We then entered into a high region of relatively flat icefields where fast mileage can be made as long as weather permits. Although partially underlain by Pre-Cambrian sedimentary rocks, the icefields are chiefly supported by intrusive granites of the Mesozoic Bugaboo stock, which extends as far north as the northern end of Mt. Conrad. Some theorists believe that granite, besides being more resistant to erosion and valley cutting, reflects more heat than sedimentary rocks, thus discouraging melting and allowing more snow to accumulate.

On August 28th, Bob's birthday, we pulled out of Camp VI at 7:15 A.M. after getting up at 5:30. The weather looked good and we were even favored with a little sunshine through the clouds.

By 10:45 we had picked up the small cache and climbed to the broad glacial pass at the head of the west tongue. Beyond the pass, crevasses concealed by soft snow became dangerous and the rope was put on. We were still passing along the northern flank of Mt. Thorington with its spectacular peaks cloaked in fluted

snow and blowing clouds. To the left we could look down the huge north glacier of the icefield to the deep trenches of Vowell Creek and its tributaries. Slowly new horizons opened to us as the granite spires north of the Bugaboos and many unknown peaks swung into view.

Two hours of steady plodding through the soft snow brought us to the southern end of "Noon-attack" which comes roughly in the middle of the north overflowing glacier. We flopped down in a protected spot and devoured our lunch. On the east side of "Noon-attack" is the largest part of the north glacier, the part which comes directly down in an icefall from the high névés surrounding Mt. Conrad. Much was concealed by clouds, but our route to the névé east of Conrad was clear.

At 2.00 we climbed down a short icefall onto the eastern part of the glacier and crossed it in a southeasterly direction. After a short rest on the far moraine we curved up past the main icefall and continued up a long, gentle grade toward the high point of the névé east of Conrad. The lead was exchanged from time to time in order to share the work of breaking trail through the soft snow. As the late afternoon wore on, it became necessary to halt every 15 minutes for rest.

The world of trees and meadows was far below. Only the tops of mountains showed above the edge of the domelike icefield. Heavy clouds glowing with the afternoon sun boiled over Mt. Conrad, bringing snow flurries. Very gradually, as the slope eased off, granite spires to the east and southeast came into view until almost imperceptibly about 6:30 the snow became perfectly level. This was the top of the icefield from which all ways led downward.

We turned off to the eastward, seeking a camp which we could reach before dark. On the far side of the glacier which flows to Malloy's Creek from the Malloy's Creek–East Creek glacial watershed pass, we sighted a snow-free boulder pile. To reach this it was necessary to find a way down a 500-foot snow-covered icefall. At the edge of the névé, windblown snow had smoothly concealed several crevasses which I discovered the hard way by going into one up to my neck. A peculiar ridge down the center of the icefall was selected as a route because there was less snow

and crevasses were better exposed. I had to probe carefully and laboriously at every step without regard for the encumbrance of my pack. We all realized that this was a critical time in which we were moving over very dangerous ground at the end of our hardest day.

Meanwhile the eastern peaks were lit by a sunset light which reflected on the jagged blowing clouds and set the sky on fire. Bugaboo Spire and then snow-sheathed Howser Spire came into view as we passed the last dangerous parts of the icefall and started across dry glacier toward the boulder pile. The last shreds of storm were being driven from the sky. We paused several times on our weary march to gaze out over the valley of Malloy's Creek to the dark forms of Carbonate Mountain, Brouillard, and Syphax outlined by the last copper glow of twilight. Ever so slowly the campsite seemed nearer until at last we were there, congratulating each other on our perseverance. The unknown territory had been crossed and we had only one more day to go to reach Boulder Camp in the Bugaboos.

We managed to fashion two tent platforms among the rocks and cooked supper from sleeping bags to protect ourselves from a freezing wind blowing off the ice. Soon we retired to the chilly tents and a long-earned sleep.

Despite bright sunlight it was very cold when we got up the next morning. Rob had been nervously exhausted by the previous day and resisted all persuasion to accompany the other four of us when we set out for Mt. Conrad at 11:00.

With Fen leading the rope we retraced our route of the previous evening up the icefall to the high névé. The upper part of Mt. Conrad was completely obscured by clouds, but the névé and the foot of the climbing route on the north ridge were clear. By 1:30 we had crossed the névé and were kicking steps in steep snow leading up to the ridge. A short detour around a rock tower brought us onto a very broad snow ridge and we climbed upward into the clouds.

To our left the steep east face fell away, while to our right the snow of the ridge pitched off gently into the west snow face which runs directly to the high west névé of the Conrad Icefield. From time to time we sighted rock shoulders on the crest of the

ridge which we easily circumvented by snow on the west face. Each of these we fondly imagined was the rocky summit which Professor Richards had described. Fen was doing a marvelous job up at the head of the rope, fighting through ever deeper snow. The wind and cold were beginning to take their toll although we had on all our clothing. I was a thousand times thankful that Fen, Gene, and I had had experience with similar conditions on Mt. Washington in New Hampshire. Without this we would surely have turned back.

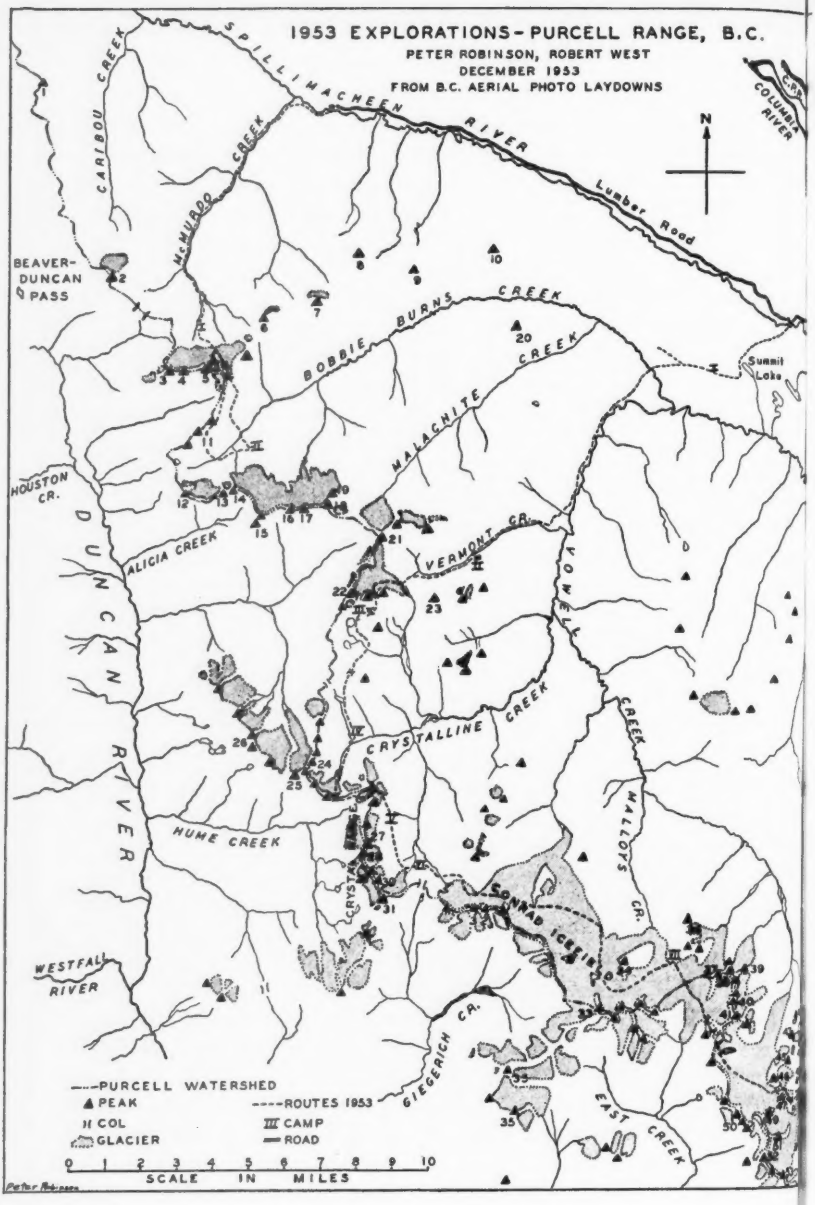
At last we came across the steep west side of a tower we felt sure must be the summit. We climbed up some snow-covered talus to the crest of the ridge and thirty feet farther south found the remains of the cairn built twenty years before. Fen soon found a battered cigarette tin with a soggy piece of paper enclosed. With this deposited in my pack, the others huddled close around me to have a bite of cheese and to protect my hand from the cold wind while I quickly scribbled a note to be left in our own can. Ten minutes later, at 3:10 P.M., we started down.

The only incident of the descent occurred when Fen, now last on the rope, popped into a small crevasse high on the ridge. Lower down I was barely able to find our footprints which had been filled by drifting snow. Once the tension of the climb was over, we began to shoot pictures in all directions. Again the vast field of ice and snow held us fascinated.

At 5:25 we greeted Rob back at Camp VII. He had found a small cave under a boulder where we could cook and be sheltered from the wind. This came to be known as "Shaft No. 7" and will probably be used as a bivouac on future exepditions.

The morning of August 30th was very cold and windy. We left Camp VII at 10:40, expecting a reasonably easy final day. Soon mist settled down around us as we walked up the long gentle snow slope toward the Malloy's Creek – East Creek pass. A few minutes after noon we began to encounter crevasses on the southern slope beyond the pass and put on the rope. In ten minutes we arrived on the brink of a large icefall which we had not suspected from the aerial photographs.

Moving along the edge of the first crevasse which was in some places 40 feet wide, we went out on the end of a sort of "penin-


1953 EXPLORATIONS - PURCELL RANGE, B.C.
PETER ROBINSON, ROBERT WEST
DECEMBER 1953
FROM B.C. AERIAL PHOTO LAYDOWNS
SPILLIMACHEEN RIVER
Lumber Road
COLUMBIA RIVER
CARIBOU CREEK
McMURDO CREEK
BEAVER-DUNCAN PASS
BOBBIE BURNS CREEK
MALACHITE CREEK
Summit Lake
HOUSTON CR.
ALICIA CREEK
DUNCAN RIVER
VERMONT CR.
KOMEL CREEK
CRYSTALLINE CREEK
HUME CREEK
WALLOYS CR.
SONNAR ICEFIELD
WESTFALL RIVER
GIEGERICH CR.
EAST CREEK
PURCELL WATERSHED
PEAK
COL
GLACIER
ROUTES 1953
CAMP
ROAD
SCALE IN MILES

We especially want to express our appreciation to the Surveys and Mapping Branch, British Columbia Department of Land and Forests, for making available aerial photograph laydown sheets and advance copies of drafted material. Glaciers and peaks were determined from personal observations and a study of R.C.A.F. aerial photographs. We want to express thanks to Dr. J. M. Thorington for making available funds to purchase an important share of the R.C.A.F. photos.

KEY TO PEAKS ON PURCELL MAP

 # — Indicates official survey station
(8500) — elevation in feet

1. Caribou Peak—#8509
2. Silent Mountain—8500
3. Notch Peak—9400
4. Cony Peak—9400
5. Simpson's Folly—9450
6. Mt. Beverly—9200
7. Unnamed—9250
8. Corner Peak—9550
9. Unnamed—9449
10. Unnamed—8851
11. Hidden Hills
12. Carbonate Alpha—9100
13. Carbonate Beta—9000
14. Carbonate Gamma—9000
15. Battlement Peaks—9600
16. Carbonate Mountain—10,150
17. Richards Peak—10,000
18. Horseman Spire—9850
19. Unnamed Spire—9850
20. Cairn Mountain—8400
21. Mt. Syphax—ca. 9600
22. Mont Brouillard—ca. 9800
23. Mt. Ruth—ca. 9200
24. Barrier Peaks
25. Unnamed—over 10,000
26. Unnamed Granite Peaks
27. North Peak, Crystal Mountain—ca. 9700
28. South Peak, Crystal Mountain—ca. 9700
29. Unnamed—ca. 9750
30. Guestaform—ca. 9600
31. Unnnamed—ca. 9800
32. Mt. Thorington—ca. 9900
33. Mt. Conrad—ca. 10,400
34. Mt. Malloy—ca. 9800
35. Southwest Peaks—#9
36. Vowell Peak—ca. 9800
37. West Peak
38. Center Peak
39. East Peak
40. Mt. Kelvin—ca. 9700
41. Wallace Peak—ca. 9600
42. Northpost Spire
43. Brenta Spire
44. Blue Lake Spire
45. Crescent Spire
46. Bugaboo Spire
47. Snowpatch Spire
48. Eastpost Spire
49. Pigeon Spire
50. Howser Spires
51. Marmolata
52. Flattop Peak
53. Howser Peak

sula" which came to within 15 feet of the other side. Setting down our packs, Bob gave me a belay and I cut a line of ice steps down the extremely steep end of the "peninsula" to a point where the crevasse narrowed. I jumped across to the other side and climbed to the top of a mass of seracs. Bob came across the same way and then we began hauling the packs across on the rope.

After the loads were across and Fen had come over via the crevasse, Bob and I picked up our loads and began exploring the route along the narrow tops of the seracs. We went first left, then right, until confronted by a 130-foot cliff overhanging at the

top, below which the chaotic part of the icefall ceased. Luckily we were able to cut a precarious route along the edge of an ice flake and into a sort of cave under the overhang. A little chipping on a projecting piece of ice gave us a rappel point or "ice bollard" from which we rappeled with our packs to a small platform halfway down. A few feet lower a second "bollard" was hewn from the ice, and with the use of this we all reached the bottom safely at 2:30 P.M.

We stopped for lunch when we reached the level glacier and then started up a 500-foot snow chute toward the northwestern edge of the Warren Glacier, which we reached at 4:30. At last I was on familiar ground and knew no serious obstacles could block our progress. We headed out across the great expanses of dirty gray ice toward Bugaboo–Snowpatch Col. To the southwest, heavy clouds hung low around the bases of the spires. The glacial pond of previous years had drained, leaving a chaotic pile of blue ice blocks.

At 6:30 P.M. we finished the tedious grade up to Bugaboo–Snowpatch Col and started down the steep east snow slope which was in very bad condition. We were soon strolling down the Crescent Glacier and following human footprints among the terminal moraines. A thin column of smoke could be seen curling up from Boulder Camp. By 8:30 we were back in "civilization," among many friends from Boulder, Colorado, the Sierra Club, and the Iowa Mountaineers.

We had completed the traverse exactly on schedule. Surely there is no finer feeling in mountaineering than that derived from looking back on difficulties overcome only by a strong combined effort in the spirit of loyalty and companionship. Two days later the weather turned perfect and remained so for nearly a week.

P. R.

Summary of Statistics (Part I)

ASCENTS: First ascents by party of David Peak, Cony Peak, Twin Towers Peak, Carbonate Mountain (ca. 10,200 ft.), Richards Peak (ca. 10,050 ft.), and Horseman Spire in the Purcells, British Columbia; first ascent of Silent Mountain

(ca. 8500 ft.) by Briggs and Ray; first ascent of Beverley Peak (ca. 9150 ft.) by Humphreys and West.

EXPLORATION: Spillimacheen and Carbonate Ranges, British Columbia.

PERSONNEL: Robert C. West, Jr., leader; Winslow Briggs, John Humphreys and Peter Ray.

Summary of Statistics (Part II)

ASCENTS: Mt. Syphax, ca. 9600 feet, first ascent, August 22nd (1953); Mt. Brouillard, ca. 9800 feet, first ascent, August 23rd; Crystal Mountain—North Peak, ca. 9700 feet, first ascent, August 26th; Mt. Conrad, ca. 10,400 feet, second ascent, August 29th. All climbs made in the Purcells.

EXPLORATION: First crossing of the Conrad Icefield, approximately 15 square miles of ice with nine outflow glaciers.

PERSONNEL: Peter Robinson, leader; Robert C. Brooke, Robert C. Day, Fenwick C. Riley, and Gene F. White.

North of Monarch

JOHN L. DUDRA

THE last unknown area in the Canadian Coast Range which has been largely ignored by mountaineers is situated northwest of Mt. Monarch (11,720 ft.) and south of the headwaters of the small Bella Coola River tributaries. Generally speaking, the whole terrain is a plateau of approximately 7500 feet in average elevation, lying in a northwest—southeast direction, bordered by mountains. The northern half consists of rugged peaks and glaciers, but the southern half is composed of snowfields, a few large glaciers, and an ice cap. Four hundred square miles of mountaineering region is too large an area to be overlooked for long. An intriguing aspect of it is that on the topographical maps it is shown as a dark brown blank with the following notation "Numerous Glaciers—Peaks 9000 to 10,000 ft."

Henry S. Hall, Jr., and Hans Fuhrer were the first men to see a portion of this remote plateau when they made a successful first ascent of Mt. Monarch in 1936, but aside from the brief description of what they saw and their photographs from the summit, nothing was known about this area or what it contained in mountaineering prospects. In recent years, mountaineers contented themselves with climbing in the less remote terrain of the Coast Range and shunned the plateau with its peaks because of the difficulty of approach which involved very long back packs through brushy north-coast valleys.

Finally, after a lapse of 15 years, two other mountaineers were rewarded by a look at this unknown land, but this time from the northwest. Pete Schoening and I gazed in wonder at this huge plateau of glistening glaciers and snowfields when we made

the first ascent of Mt. Saugstad (9700 ft.). Sharp granite mountains of coast range structure rose in glittering splendour captivating our gaze as we perched on the summit scanning the southeast horizon.

One very interesting object which attracted our attention was what appeared to be a body of water dammed up by a glacier. The lake seemed to be in a pass or a very high valley, and so at once speculation began as to whether or not a plane could land on it. If an aircraft landing could be accomplished, it would save many days of relaying supplies up from the deep inlets.

After returning to civilization, we set about locating maps which would show more detail of the area. Our main quest was the location of the lake or some prominent feature, but no maps could be found which had this information. After a lapse of two years, I procured a sizable stack of government aerial photographs of the area and from these compiled a map which seemed reasonably accurate for use, until compass bearings were taken and tied in to rectify any errors made from the airphotos. The next difficult task was to convince the skeptical air-line companies that an aircraft could land and also take off after discharging the climbers at the lake. With this done the open road to the "Promised Land" would be ours.

On the evening of 2 July 1953 at 6 P.M. a Beaver with four climbers, 500 lbs. of supplies and gear aboard took off from Bella Coola bound for the mysterious lake. The weather was unsettled with a 9000-foot ceiling of heavy cloud layer obscuring the summits of the mountains, but the flight went well. As we flew low over the huge glacier in the pass, water came into view, beautiful, green glaciated water, two miles long—ample length for a Stranearer to take off. We banked sharply, dropped, and the pontoons were knifing the surface as the plane settled in the water, bringing two years of scheming, hoping, and planning to a reality.

My three expedition companions were members of the A.C.C. and exceptionally versatile climbers. Fips Broda has had a lot of experience in the Alps and has also climbed Elbruz in the Caucasus. Jack Atkinson, who acted as the official photographer and first-aid man, is also an excellent ice and snow climber and

performed remarkably well on rock. Howard Rode has had some experience in the Selkirks, Cariboos, and the local mountains near Vancouver.

After our landing, all the supplies with the exception of the air-drop cans were unloaded on a small sandy beach, where a fresh-water creek flowed into the lake. Jack and Howard began to make camp while Fips and I took off in the aircraft to make an air drop further south. With the drop completed, the pilot brought us back to the lake, wished us luck, and took off as sunset was approaching. By the chilly evening sun we took stock of our surroundings and checked the rough map over and over again. As was earlier surmised, the lake (Ape Lake, 4555 ft.) is situated in a pass and drains into the Talchako River. The Noeick River drains west of the pass while the glacier contributes to both watersheds by spreading to two sides at the snout. The location of the lake is ideal as it affords a centralized camp for climbers in absolutely virgin territory.

The primary object of our expedition was to cover and explore as much of the area as time would allow and climb a few peaks enroute. In order to accomplish the long journeys between distant points skis were included as one of the vital parts of our equipment.

We packed enough food to last us until we picked up the air drops and the rest was cached by the lake for future use. The plan was to reach the air drop and proceed south until a camp could be set up which would put us within striking distance of Monarch.

We followed a large moraine from the lake to the glacier above it, just below an icefall that tumbles from the north flanks of Mt. Jacobsen. From there on, skis and skins were used exclusively as our mode of travel. Climbing slowly with heavy packs we followed the glacier to its névé fields near pass #1 (ca. 8000 ft.). On the south side of the pass, several magnificent peaks could be seen as well as two parallel snowfields leading to the ice cap.

A 2000-foot drop from the pass to the upper Jacobsen Glacier was a pleasant change from the continuous climbing. Crossing the glacier on skis did not present the hazards of breaking

through crevasses which normally threaten a party on foot. After reaching the other side, Howard set up camp in a curious wind cirque, near a rocky peak protruding from a glacier, while the three of us went to recover the air-drop supplies.

Next morning with everything divided for the advance and return, we broke camp and moved in a southeast direction towards the ice cap. In the evening, on a high rock outcrop overlooking the big expanse of snow and in full view of Monarch, we decided to set up Camp 3 (8100 ft.). This camp put us within a reasonable distance of Monarch and also of a nice glaciated peak directly south which we named "Princess Mountain."*

Four A.M. dawned cold and clear with our spare water supply outside frozen solid. After a warm breakfast we readied our packs and gear for the coming climb. "Princess Mountain" was the big effort of the day as a preliminary warm-up climb to Monarch. The trip to the base of "Princess" proved longer than expected because of our underestimation of the wide expanse of snow. In this area, to one who is not familiar with large glaciers and snowfields, distances become very deceptive until the scale makes itself known through the long trek that one has to make. Our skis were left at the base of a large rib on the north side. From there a prominent spur ridge leading almost directly to the summit proved to be a good route. No difficulties were encountered although near the top a 30-foot overhanging cornice forced us to make a delicate traverse on the exposed south side. According to two aneroids which were in agreement, a rare occurrence, the elevation reading at the summit was 9450 feet.

Back at Camp 3, over hot soup, food, and tea we concluded that the day's 20-mile ski trip with the climb was a fair accomplishment. Unfortunately the preceding three days had been so strenuous that the constant pushing and the hard pace began to show on the party. Rode had blistered feet, Atkinson was badly sunburned even though he took all necessary precautions, and Broda's feet resembled two pieces of raw meat. Luckily, I escaped these annoyances which plague climbing parties. Not knowing how our strength would be by morning, it was decided to wait until then before making definite plans. During the night

*The name "Princess Mountain" is unofficial.

Atkinson's lips swelled to unbelievable proportions; to take a risk of further aggravating them seemed foolhardy. Rode also thought that he would be unable to walk for a few days until his feet improved.

Not wishing to sacrifice our chance for Monarch by a delay, in case the weather turned bad, Broda doctored up his feet with salve and yards of tape and insisted he was well enough to go. We made up packs for two days, intending to bivouac, put on our skis, and started out at 10 A.M.

Immediately west of Monarch two parallel glaciers flowing north into Talchako Glacier and separated by a large rocky rib offered a good route to reach the west face of the mountain. Half way up the west glacier a low point on the rib enabled us to cross over to the eastern glacier which flows past the west face of Monarch. We crossed a bergschrund below the ridge on a conveniently located snow bridge which seemed a little shaky but bore our weight. From this point with the help of field glasses we had a close look at the huge west wall which we hoped to climb. Prospects of the different routes were carefully considered and evaluated. On the left of the main face an excessively steep icefall was unanimously rejected, whereas on the far right 3000-foot vertical walls were also out of the question. A route finally selected as practical wound up the center face to a large buttress, above this to a snow filled couloir, and then to a big snowfield on the upper half of the face. The summit ridge would have to be gained at some low point. After making a rough sketch of the route we descended to the névé pass separating "Page Mountain"* from Monarch.

"Page Mountain" is a steep pinnacle, the highest point of the rocky rib we crossed; we so named it because of its proud stance at the foot of Monarch. This bold tower fired our interest at first sight and now that we were in its shadow with time to spare

*The name "Page Mountain" is unofficial.

Top—**PART OF PANORAMA TAKEN FROM MT. SAUGSTAD**
Photo, J. L. Dudra

Bottom—**VIEW FROM SUMMIT OF MT. JACOBSEN**
Snowside Mountain in center distance.
Photo, J. Atkinson

there was no reason why we could not climb it. After eating a good lunch, we left our packs at the pass and, taking only the necessary equipment, set out for the tower. The climb proved very interesting, presenting a combination of rock, both good and bad, with ice and snow. From the summit (ca. 9650 feet) we enjoyed a view of Waddington, Silverthrone, "Princess," and a host of other unnamed lesser peaks to the south. This viewpoint also offered an excellent angle from which to study the west face of Monarch. There was no doubt in our minds as to the choice of route; the center face looked the only practical way up.

Back at the pass we shouldered our packs and started up, with the summit of Monarch our objective. We intended to climb as high as possible on the base snow slopes, then leave the skis, and proceed on foot until a reasonable bivouac place could be found. With the end of the day drawing closer, Fips finally discovered a small, flat protected rocky perch, large enough to accommodate two prostrate bodies for the night. Two pitons were driven in and some sling rope used to discourage nocturnal wanderings to the steep slopes 50 feet below.

Night passed in reasonable comfort and a cold breakfast was eaten at 4:30 A.M. Soon afterwards, stiff boots, muscles and joints were creaking, bound upward to the sun's rays near the top. Climbing was comparatively easy up to the buttress; from there verglassed rock became more evident until it resembled a near vertical ice rink. A very sharp ice knife edge connecting the top of the buttress with the side of the great couloir presented a classic example of crampon straddling and belaying until our ankles ached. Not daring to enter the couloir which funnels avalanches from the snowfield above, we remained on its left side, climbing on rock as much as possible. What appeared to be a snowfield below the rock ridge was in reality a huge slab of ice disguised with restless snow upon it, the latter ready to slip off at a moment's notice. Much time was lost on many belays up this slope until firm rock was reached below the ridge. Traveling along the serrated ridge, we could not detect where our route

WEST FACE OF MT. JACOBSEN
Route up ridge on the right, then up center face to the notch.
Photo, J. Atkinson

joined the one used by Henry Hall and Hans Fuhrer on the first ascent, but from photographs it was evident that the two were the same on the last part of the ridge climb to the top. The summit, a very small snow-covered dome, was reached at 1:30 P.M. in ideal weather.

Blessed with luck, we thoroughly enjoyed the beauty of the wonderful mountain country around us. In the south, Waddington and its satellites were very clear, as were the sharp Bella Coola mountains to the north. The ice cap stretched out to the northwest, bordered by many imposing mountains which gleamed with the light of a million candles sparked by the sun. It was unpleasant to think of leaving this panoramic view, but with the mid-day heat softening the snow a start down had to be made.

The big snowfield was treacherous, with water running on the surface of the ice. Ideal avalanche conditions prevailed as was quite evident from the booming canonades all around us. Several rappels, one of which was 120 feet, were required to descend to the buttress. The bivouac site was reached at 8:00 P.M. and, gathering up our belongings, we started down to our skis. By this time the snow had hardened, giving us a very fast run to the glacier below. In fading light we reached the site of the bergschrund bridge, below the intervening ridge, only to find it gone. The heat of the day made it collapse and the remains could be seen in the gaping hole below. This situation compelled us to descend part way into the bergschrund and then climb 40 vertical feet of snow to the upper lip. From here, with the help of the climbing rope we pulled up the skis and packs. By the time we were ready to move ahead, the last rays of the sun disappeared below the horizon. Traveling at night proved easier than we had anticipated. Visibility by snow light permitted us to travel without using carbide lamps, but the cold temperature forbade frequent stops. We maintained a furious pace over the frozen snow with only one thought in mind—to reach Camp 3 as soon as possible. As we neared the rocky outcrop on which the camp was situated, Broda began yodelling at intervals to let Atkinson and Rode know that the two weary donkeys were coming home to rest. At 1:45 A.M., weary and cold, we stumbled into the tent after 21 hours of continuous moving. Over cups of hot

cocoa prepared by Atkinson, we recited the story of the climbs and crawled into our sleeping bags.

The next morning we decided to move camp back and pick up the remainder of the air-drop supplies. The over-all plan was to climb Mt. Jacobsen on our way back, pick up more supplies at the lake, and make an all-out effort to climb "Snowside Mountain." As we neared the air-drop site, the weather grew sullen and soon great clouds obscured the mountains. Then the storm broke upon us. We were forced to set the tent up in a crevasse for wind protection and spent a damp night cursing all makers of mountaineering tents. By morning the weather had improved and, while drying wet garments, we contemplated our next move. After breakfast, Rode, who still complained of not feeling well, left for the lake camp while the three of us removed all the supplies from the air-drop tins. After everything was packed, we started back across upper Jacobsen Glacier to the first pass on the flanks of Mt. Jacobsen. In the evening with the weather clear, we studied the walls of Mt. Jacobsen, towering right above our camp. They looked very steep, exposed, and clearly not the sort of thing one wants to climb in the heart of the Coast Range. All the more feasible routes lay on the other side, but we were reluctant to lose altitude, not to mention the time in order to reach them; therefore the west wall it would be.

On the morning of July 11th, thoroughly rested, the three of us started up. The rock was exceedingly steep and the exposure severe on many pitches. In one of the numerous chimneys we had a narrow escape when the rope dislodged a loose rock from a chock stone. A good portion of the climb up to the ridge was a stiff Grade 4. Above this we unroped and scrambled on the summit.

The ascent had consumed a lot of time; so, rather than return the way we had come, we chose to descend via a steep hanging glacier on the south side, traverse around the edge of the wall, and climb back up to camp. As we neared the bottom, a roar of an avalanche filled the air and seconds later tons of ice and snow came into view, hurtling down the slopes of the east peak of Mt. Jacobsen. The hanging glacier was an unhealthy road, but it was considerably faster.

Back in camp we ate a good supper, packed up, and started

down in the general direction of the lake. We intended to cache part of the equipment on a rock outcrop, go to the lake for more supplies, and on the return trip the next day, pick up the cache and then proceed on to "Snowside Mountain."

After running down on skis for ten minutes, one of the party called an abrupt halt and in picturesque, not to mention descriptive, language told us that he had left "Excalibur," his ice-axe, at the last campsite. Since we were on skis, the ice-axes were carried in the packs and a predicament of this sort was easily understood. Leaving his pack, he set out and it was almost dark before he reappeared with his weapon tucked under his arm. We arrived at the lake camp at 12:30 A.M. and, using all of Rode's stockpiled firewood, we set up a blaze, filled pots with clear water, and began a feast that lasted until 3:30 A.M.

In the morning a dip in the lake amid small icebergs made some of us feel human again. Water at the snow camps is a scarce item and we took full advantage of this luxury to compensate for the days we went unwashed. After breakfast we packed the supplies, bade Rode goodbye, and started up for the cache.

The weather had been getting worse steadily when two hours after we left the lake, it finally broke. First rain, then wind and sleet mixed with snow drove at us until our packs were covered with ice. It turned bitterly cold while the wind kept rising in velocity. At the cache, in a shrieking gale, a rocky hollow big enough to accommodate the tent was discovered. Here we pitched camp and sat up all night taking turns supporting the tent pole while, outside, guy ropes whipped violently. We did not know the actual wind velocity, but we are convinced that, had it not been for the protection of the hollow, the tent, which is made of good material, would have gone to shreds with the wind. Stormbound for 36 hours, we played chess, sang, blew on a harmonica, and drained the last drop of brandy from our modest jug. This loss of time eliminated any possibility of an attempt on "Snowslide Mountain." Throughout the whole trip my first and greatest desire had been to climb this captivating peak, but now all I could do was look upon its walls, encrusted in a blanket of fresh snow, and vow to return again to try my luck in some coming year.

MT. ATWISS
AURORA PLAND
AURORA GLACIER
Camp #1
MT. SNOWSIDE
MOQUOT PASS
MOQUOT GLACIER
NOEICK GLACIER
FYLES GLACIER
APE LAKE
Camp #1
MT. FYLES
APE GLACIER
MT. JACOBSEN
MONGOL GLACIER
MT. MONGOL
MT. EMBER
MT. OGRE
MT. MOLOCH
Camp #3
MT. AZA
Camp #2
MT. RIMMON
SNOW
TALEOMEY RIVER
Air Drop
SNOW FIELD
MT. LORETA
TALEOMEY GLACIER
MT. GERYON
MT. ELFREDA
MT. CERBERUS
MT. SCIRON
SUTTHOLT CREEK

COAST RANGE
MT. MONARCH & MT. SNOWSIDE AREA
MAP PLOTTED AND DRAWN FROM AERIAL PHOTOS BY J.L. DUGRA
GYLLENSPETZ CREEK
TALCHAKO RIVER
MT. APE
APE CREEK
MT. TALCHAKO
JACOBSEN GLACIER
JACOBSEN CREEK
MT. AZAZEL
Camp #2
MT. BELIAL
MT. BEELZEBUB
MT. RATCLIFF
52°00'
SNOW FIELD
MT. DRACON
Camp #3
ICE CAP
TALCHAKO GLACIER
MT. PAGE
MT. MONARCH
MT. PRINCESS
PRINCESS GLACIER
PAGE GL.
ANOT LK. WATERSHED

On the way down the glacier we cached our skis under a huge boulder for some future use because to carry them out was a prohibitive thought. Rode was waiting for us at the head of Noeick River after he had brought over the remainder of our supplies from the lake.

Next morning in swirling fog we started uphill, bound for the pass at the head of Noosatsum River watershed. Behind us lay a wonderful land, full of enchanted peaks, truly a marvel of nature—while ahead awaited the deep gloomy gorges of the upper Noosatsum. For four days memories of the ice and rock land left behind kept us going through places only people familiar with the Coast Mountains can appreciate, until finally our tricounis bit the road gravel of the Bella Coola valley.

The expedition had been a marvelous experience in new unexplored country where mountains stand second to none in ruggedness and beauty while myriads of glaciers keep one's memory alive with a pleasant past.

In the future some of us will definitely return to this unforgettable area, to feast our eyes on the beauties of its mountains and to try our luck on "Snowside" and other peaks. One thing is certain, come what may, on the outgoing trip an aircraft will replace for me the waterfalls of a mad mountain river.

Summary of Statistics

ASCENTS: First ascents in the Canadian Coast Range of "Princess Mountains," 9450 ft., and "Page Mountain"; second ascent of Mt. Monarch by Broda and Dudra; first ascent of Mt. Jacobsen by Atkinson, Broda, and Dudra.

EXPLORATION: Area northwest of Mt. Monarch and south of the headwaters of the small Bella Coola River tributaries in the Canadian Coast Range.

PERSONNEL: John L. Dudra, leader; J. Atkinson, F. Broda, and H. Rode.

Demavend and Ararat, 1951

OLIVER S. CROSBY

As we drove down the dusty road from Tabriz to Tehran, Hermann Dietrich and I became more and more excited at the thought of the climbing which lay ahead. For months we had discussed with Les Rood plans for the ascents of Mt. Demavend, 18,605 feet, and Mt. Ararat, 16,916 feet, and now at last our dreams were about to be realized.

The two peaks, some 520 airline miles apart, are the highest in Iran and Turkey; Demavend is situated in the center of the Elburz range immediately south of the Caspian Sea, and Ararat stands by itself to the south of the Caucasus Mountains at the point where the Turkish, Iranian and Soviet borders meet. The strategic location of Ararat had made the securing of climbing permits doubly difficult, but we had laid the groundwork carefully, Hermann and I approaching the matter from Tabriz, where he was teaching in the Technical School and I was Vice Consul, and Les Rood doing what he could from the American Embassy in Tehran. We had informed officials of our intentions months in advance, had secured approvals, passes, letters of recommendations, visas, automobile permits, and so on and on. Now at last it was time to move. And move we did: we burned up the roads, heading first for the 18,605-foot Demavend.

Once arrived at Les' house in Tehran, we set to work checking our equipment and assembling the required food supplies. Our gear was of the most informal variety, being what warm clothing and camping equipment we had on hand: rucksacks, sleeping bags, canteens, food and extra socks and sweaters. The only technical items, my pitons, nylon rope, and ice-axe, would go along in the car, but only because we were not really sure what to expect from the great Demavend.

Demavend and Ararat, 1951

The hazards of mountaineering in the Middle East are not confined to the mountains themselves, but extend most particularly to the information and advice one receives about any projected climb and its dangers. In the case of Demavend I had been told the most harrowing and conflicting stories imaginable and half expected that we would have to complete the last 2,000 feet on hands and knees, with our mouths masked against the choking sulphur fumes of the smoking summit. One colorful adviser urged that we insert garlic cloves in our nostrils to counteract the sulphur and enable us to enter the dreaded area and return alive. We tended to discount these stories, but they still lent a special atmosphere of mystery and excitement to our undertaking.

We took off at the appointed time, bucking along the rough dirt roads in our jeep and feeling the thrill of high adventure as we wound through the red and brown barren hills of the Elburz. After about three hours we reached the final pass and were confronted by the mountain, raising its massive, volcanic cone a good 12,000 feet above the floor of a broad valley. In the afternoon light, the smooth slopes of Demavend appeared very regular, suggesting no particular route to be preferred over another. The ridge to the west seemed slightly gentler but very long as it swept majestically upwards to the pale yellow sulphur cap at the peak. There was sulphur there, all right, and it remained to be seen how powerful the fumes would be in the rarefied atmosphere.

After a long look at Demavend's steep sides, we drove on down into the valley and across to a small village perched a couple of thousand feet up on the east slope of the mountain. At the villages Les contacted Ali, a guide he had arranged for, and we dickered over a horse to carry our duffle up to the high camp the next day. There was another group of hopeful climbers camped in a field outside the town, and we joined them, slinging down our gear and breaking out food and drink for supper. At the grand communal banquet that evening we were regaled with the most horrendous of the tales we had heard about Demavend. Sack time came early, for none of us was in condition and we wanted to build up what reservoir of strength we could

before the onslaught. The night was starlit and still; the lights across the valley winked out one by one until only a couple of shepherds' fires remained; a goat bell tinkled restlessly in the distance, and I could hear Hermann grunting as he struggled to turn over in his sleeping bag.

The bustle began early the next morning, and there was a great, gray confusion of disheveled ghosts trying to assemble their gear and get breakfast. As time passed, the confusion increased, and it seemed hours before we located our pack horse, loaded up, and were on our way. The route spiraled up to the left toward the south side of the mountain, leading us through a rough, eroded area sparsely covered by thorn bushes and thistles. The day grew warm, and we took our time, stopping occasionally to stare across the valley at the barren brown hills or look up toward the ever-distant summit of Demavend. The yellow cone was not visible from the lower slopes, and as the angle steepened we saw less and less of the top part of the mountain. The climb to high camp at about 14,000 feet was uneventful, and our horse managed to make it all the way, although the poor beast had a rough time of the last two thousand feet of treadmill-loose scree.

The other party halted at the 12,000 foot camp, so we had our choice of the shallow depressions scraped out of the dirt around the exposed southwest ridge. Picking our way gingerly among the teetering dry walls erected by goatherds to provide some shelter from the wind, we found a fairly level space big enough for three of us, overlooking the long, rocky slope on which goats were now grazing because the forage lower down had been dried up by the summer sun.

Supper was unimpressive and quickly dispatched as we sat hunched in our ski jackets, watching the changing colors of sunset play on the peaks around Demavend. The Elburz range to the south seemed to be on a level with us, and its buttressing ribs stood out dramatically in the sunlight against the dark of bleak gulleys between them. We noted that at about 14,000 feet the atmosphere, which was dust laden and brown, suddenly became crystal clear. The line of demarcation was so sharp that it accentuated the unclean appearance of the lower air and made

Top—MT. DEMAVEND, 18,605 FT.,
from the south in the valley at the foot of the peak.
Photo, O. S. Crosby

Bottom—Left to right: Rood and Dietrich beside horse, en route to Demavend.
Photo, O. S. Crosby

Top—ON WAY TO NOMAD CAMP IN ARARAT FOOTHILLS *Photo, O. S. Crosby*
Mt. Ararat, 16,916 ft., in background.

Bottom—LESSER ARARAT with
Crosby in foreground at about 12,500 feet. *Photo, H. Dietrich*

us appreciate all the more the bracing, if somewhat thin air we had to breathe.

The cold descended on us quickly that night, and it would be difficult to say how much of the time was spent in genuine sleep. Two inescapable rocks seemed bent on punching in my lower ribs, and I remember half emerging from my sleeping bag a couple of times to put on another shirt and two more sweaters. My luminous wrist watch was consulted repeatedly, and at length I had the satisfaction of seeing the hands point to one o'clock. Up, in a shaking, chattering, subdued bustle, we were at once lacing our boots, chewing on hardboiled eggs and cheese, packing our rucksacks for the climb, and looking out into the dark, frigid night.

Fortunately, the wind was quiet from one o'clock to two, and we were well on our way, following the guide up a completely invisible mountain-side, before the gale caught us. We were immediately pierced through and through by the breath-taking cold. Gloves which had been removed were hastily pulled on, and every button was buttoned and zipper zippered. Still we froze. I don't know how cold it actually was, but the streams we crossed were frozen. The intake of cold air in our lungs seemed to shrivel them, and for the first time I began to notice the thinness of the air.

Ali was slugging on ahead, picking his way by the light of a candle flickering in a transparent shelter; I was more up-to-date with my shiny flashlight, but the thing soon dimmed and went out. From then on the night was very dark. The stars shone brightly enough, but they were of precious little help to me on the mountain.

The ridge we were climbing became steeper and more jumbled, and although it never became technically very difficult, we had to hold on with care and watch our balance in the buffeting darkness. The rough lava formations cut our shins and gloved hands, but at least they afforded ample holds.

By four o'clock we were in the neighborhood of 16,000 feet, and it began to be apparent that Ali was having stomach trouble. His stops became more frequent and longer as we progressed, and by the greyness of approaching day I could just make out his

shape as he huddled miserably behind one stone or another, seeking shelter from the arctic wind. Ali's slower pace was at first welcome in the thinning air, but soon we became chilled to the bone and urged him on so as to restore our circulation. His dinner of the night before was making him wobbly and dispirited, however, and from then on we did the leading and Ali brought up the rear. In the growing light, it was a simple matter to pick out the route, for it could lead only upward. We pushed on, driving to the limit just to keep warm. The sunrise was welcome as providing at least moral support.

Imperceptibly, the tearing wind became less frigid, and soon we were climbing under ideal conditions. About a thousand feet below the summit my stomach began to feel uneasy, but nothing worse developed, and with the yellow goal so close ahead, there was plenty of incentive to keep moving. About 200 feet below the top the slope eased, and we came to the rim of the sulphur cap. In the fresh, cold air there was no trace of sulphur fumes, and we slowly climbed on up through the soft yellow stuff, our boots sinking in a couple of inches at every step. The altitude was telling on all of us, and those last two hundred feet were long ones. We passed a plume of sulphur smoke on the way, but it was easily avoided, and at last at eight-thirty we reached the summit.

The top of Demavend is an irregular place, sculptured out of lava and sulphur. A narrow passage cut on the south side of the mountain, just ten feet below the peak, afforded good shelter, and we basked happily in the sun and ate a second breakfast. Once we had attained the high altitude, I didn't notice it much and walked about the top with ease and much exhilaration. To the north of the peak the rock fell away sharply into a fair-sized crater in the bottom of which there was a frozen pond some two hundred feet across. The view out from the mountain seemed to stretch into infinity on every hand, but there was actually little to be seen down through the sea of dust-laden air lying below us at 14,000 feet.

After a long, garrulous visit on the summit, we loaded up and started down once more, flying through the grainy sulphur like slaloming skiers. The descent was quick, facilitated by glissad-

ing in a long snowfield to the west of the ridge we had climbed. By eleven we were at the 14,000-foot camp again, ready to assemble our gear and pack out.

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That evening, when we drove up to Les Rood's house in Tehran, his wife met him with the news that they had received transfer orders and were to proceed immediately to Malta. Regretfully, Hermann and I made preparations to move on to Turkey alone.

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Our dusty road took us through Tabriz, where we reprovisioned and picked up Pierce Bahnsen, one of the Consulate clerks, as a passenger. From there we drove northwest through Khoi and Maku into Turkey. A half mile beyond the border post of Bazargan a turn in the road brought us face to face with Mt. Ararat, and I almost drove off the road in my excitement. 'What a mountain!! She may be small compared to Demavend,' I thought, 'but Oh, My!'

The rugged bulk of Ararat, towering to a height of 16,916 feet out of the plan of Dov Bayazit, was a thrilling and awesome sight. On its higher reaches vast, glistening snowfields swept steeply upward for over three thousand feet; a hanging glacier was perched on its south face. Massive rock buttresses lent a note of power and violence to the mountain, and cold, black rivers of lava wound their way from it onto the plain like the tentacles of some gigantic octopus. Here was a mountain with character and variety to match its size! The challenge of the peak filled us with quick, suffocating eagerness.

We hurried on to Dov Bayazit to make the necessary arrangements with local officials, for my leave was almost ended, and time was precious. We found the local Sub-Prefect to be friendly but unenthusiastic about our climb. He warned that Ararat was very dangerous, but after much argument he finally relented and granted us permission to proceed the following day. We were overjoyed.

Morning found us gathered outside the Sub-Prefect's house, studying possible routes up to the south face or along the east

ridge. The day was one of the most sparkling beauty, and we were wild to be under way, but once again it was easier said than done. Even with the help of the Sub-Prefect, it took the best part of an hour to hire a driver and two oxen (!) to carry our provisions and climbing equipment. At long last we drove our jeep from Dov Bayazit to a point just south of the mountain where we were to meet the oxen. They were late, and we had lunch.

The two beasts arrived about one-thirty, were loaded up, and we took off across a two-mile flat of volcanic ash and thence into the foothills of Ararat. The going was easy, and we had plenty of time to gaze at the mountain's great rock shoulders, its majestic snowfields, its glacier, and the tangle of ridges fanning out from its sides. The best route seemed to lead up the south ridge facing us, although the east ridge offered the advantage of a better view of Lesser Ararat. The latter was a symmetrical red-gray cone which rose east of Ararat to an altitude of about 14,000 feet. Our inspection of the mountain was brought to a close by the gathering darkness, and it was night by the time we reached the Kurdish shepherd camp at about 11,000 feet, where we were to sleep. Our arrival caused great excitement, and we were at once surrounded by an admiring, chattering crowd which did not leave us until long after we had eaten and crawled into our sleeping bags.

The three of us were up at four the next morning, dressed, ate breakfast, loaded up for the climb, and attempted to set off. But our way was blocked by one of the armed guards of the camp, who made it clear that we were not to leave. We remonstrated; two more guards came over to support the first. It was apparent that the nomads did not want us to climb their mountain, but we were not to be put off now and raised a terrible hullabaloo. Our arguments, in broken Turkish and Persian, and the nomad consultations continued as the east grew bright and the sun rose.

We were never sure just what their objection was, but finally, after four hours of wrangling, we were allowed to depart in an easterly direction. An escort was sent along to see that we did not turn in toward the south face of the mountain, so we were

obliged to make the long detour around to the east ridge, crossing countless gullies, lava streams, and fields of jumbled black blocks as we slogged our way along. We soon outdistanced our escort, but by that time we were below the hanging glacier, and there was nothing for it but to push on around. The traverse to the east ridge took two precious hours and gained us but little altitude; it was gruelling work, and finally Pierce, who had done no climbing before, could go no further. He stopped to rest a bit and then returned slowly to the nomad camp to wait for us.

It was ten o'clock when Hermann and I finally turned our faces toward the summit of Ararat and began the real climb, starting up the east ridge from somewhere in the neighborhood of 12,000 feet. It was late, maddeningly late, but that could not be helped, and we were grateful to be on the mountain at all. The day was perfect, and the brilliant sunshine presented us with scores of breath-taking views of the south face of Ararat. We climbed steadily on the volcanic stone and moved up the ridge at a good pace.

About 1,200 feet higher we came into snow, which the hot sun had turned to slush. There was no apparent way of by-passing it, so in we plunged, slipping and sliding and wishing that we were on solid rock once more. Near the occasional outcroppings of rock the snow was swept away entirely by swift rivulets of its own water. The earth and stones of the outcroppings were oozing with water, too, and not solid enough to stand on, so we were forced to continue the uphill battle on the snow. Progress was slow and exhausting; the snow slope continued on and on, all the heat of the sun converging on us from the great white reflector. Hermann and I pushed on, striving for altitude and working hard to keep our footing. Each step, carefully kicked in, was apt to collapse in front, in back, or on one side, breaking our pace and losing us precious time.

As we mounted in a steady zig-zag up the great snowy east side of Ararat, the air became noticeably thinner and colder, and we rejoiced to feel the snow harden under our boots. Finally, we stood well above the top of Lesser Ararat and were approaching the shoulder of Ararat proper at about 16,000 feet.

By three-thirty, despite the fact that the sun was still well up

in the sky, the cold had so increased that it seemed the chill of night was on the mountain. At the same time, a piercing wind struck us and rocked us about on our feet. The change in wind and temperature took place with phenomenal quickness as we entered the shoulder snowfields leading northwest to the mountain summit. The frigid upper reaches of Ararat had a wild, rugged look. Great boulders projected from the snow all around us, teetering on the verge of a meteoric plunge down the slope. To the left the head of the cracked and broken glacier wall was just visible, the thin strip of snow across its top leading westward toward ridges and buttresses which rose almost 6,000 feet above our camp. Our route was plain enough and even gave promise of becoming less steep in time. We climbed on, watching the final peak of Ararat move nearer, grow larger and more distinct.

It came to be four o'clock and then four-thirty as we continued our progress upward through the boulder-strewn snowfield. The angle of the snow had not declined as much as we had hoped at the shoulder, but this at least allowed us to gain altitude and approach the summit more quickly. It loomed before us, tantalizingly close, and yet we seemed to move toward it at a snail's pace. The sun's outline became blurred behind a white haze of fine snow torn from the mountain and hurled across its peak by the east wind. Fortunately, this wind was at our backs, but still it reached into our muscles and lungs. The sun had no warmth to offer as it shone palely through the snow-filled air, and I began to recognize the threat which the cold held for us. Our bodies no longer generated the heat that they had as we had worked our way up the mountain, and we were chilled through if we stopped to rest more than a minute at a time.

The temperature fell further. It was five o'clock. The awareness which had been growing in our minds and which we had been trying to stifle would no longer be suppressed. We were verging on the point of no return.

There was no doubt that sufficient daylight remained to proceed to and reach the summit, which now lay directly ahead and some 150 feet above us, but this would leave us no time for the descent. We had to get ourselves off of three thousand feet of

snow and ice before dark, for a bivouac on or near the summit of the mountain was out of the question, and the nearest descent route was apt to be tricky, as it lay over the west end of the glacier and down onto the snow beyond it. To traverse that untried route at night would be inviting trouble.

Reluctantly, we turned back, left the summit route, and began the passage over the top of the hanging glacier, just above the wall's face. The snow was hard and uneven there, extremely steep in places and interspersed with stretches of ice. For long distances we cut steps with the ice-axe and proceeded, a foot at a time, changing the lead frequently. There was perhaps an hour of daylight left when Hermann, who was leading at the time, suddenly broke through the snow and dropped into a crevasse. As he fell, he managed to catch himself with an elbow on either side, and I, straddling the hole, put a hand under each shoulder and helped him scramble out. We stood there for a moment, panting and wheezing with the exertion.

Handling the stiff climbing rope with stiffer fingers, we proceeded with utmost caution. The second time Hermann fell he was checked before he had got half way into the crevasse that blocked the way. Jumping across it, we continued to the end of the glacier, across the top of a swooping buttress and came upon the upper reaches of the long snow slope. It was almost seven o'clock and the sun had set, but in the gathering gloom we sped down the smooth snow, glissading part of the way and moving on the rope and axe where the going was more unsafe. The slope was sheltered on both sides, and for the first time the air about us was quiet. Gathering reserves we scarcely knew we had, we descended well over 2,000 feet in a half hour and neared the end of the snow.

It was now quite dark, and we were somewhere in the neighborhood of 14,000 feet. The air at this altitude was fortunately not so biting as it had been on top. We were below the glacier area and the snow was not so difficult to travel on if we proceeded slowly. Indeed it was a pity when we finally saw the last of it; from then on we moved in thick blackness, guided only by various lights in the valley, some of which we took to indicate the location of the camp a good deal to the west of our position.

The sky was clear, but the stars shed no useful light on the dark rocks over which we moved.

Traveling entirely by feel, we traversed buttress after buttress, couloir after couloir, moving slowly toward the west and that special ridge which should lead us to the camp. By eleven o'clock Hermann and I were exhausted, moving in a dream. We would ease ourselves down over boulders and across noisy but invisible streams until we could go no farther. Collapsing where we stood, we would hug the black rocks and lie there numbly. After about ten minutes, the cold would seep into us, tightening every muscle into uncontrollable shakes and forcing us to our feet and onward. The night was full of blind alleys, wrong turnings which brought us to precipices or difficult couloirs. We nosed our way around each obstacle like patient measuring worms, patient because there was nothing else to do.

At one o'clock we reached a cul-de-sac, for we found ourselves following down a ridge of loose rock which gradually slimmed to nothing, eaten away on both sides by converging torrents of water.

There was little chance of our making it back up the crumbling ridge, and it seemed impossible to cross the cascading waters: we were trapped in the gulley, teetering on the very brink of the westernmost stream and enveloped in its clammy spray. Driven on by the cold and wet, we resumed our nosing about, moving with extreme caution. The rushing foam shone with a pale whiteness, interspersed with black spots where there were rocks or emptiness. By testing these dark islands with the ice-axe, we found a precarious bridge across the torrent. The crossing was harrowing and unbelievable, like the last minute of a nightmare in which one slips and slithers in darkness at the brink of eternity, but it was finally completed, and we were safely on the far side.

The worst was now passed, for the ridge we descended became progressively less cold and less steep. We began to obtain real benefit from our frequent rest periods, and the departing numbness gave place to a great sense of peace and accomplishment. Already the memory of the agonizing night hours was fading before the priceless experiences and sights of the day before.

At six-thirty in the morning we hiked into camp, feeling invincible in the first golden light of the sun.

Summary of Statistics

ASCENT: Mt. Demavend, 18,605 ft., in the Elburz Mountains, Iran.

ATTEMPTED: Mt. Ararat, 16,916 ft.; height reached ca. 16,766 ft.

PERSONNEL: Oliver S. Crosby, leader; Hermann Dietrich and L. Rood on Mt. Demavend; Crosby and Dietrich on Mt. Ararat.

Ascent of the Natural Bridge, Zion National Monument

FRED D. AYRES

In Utah, one natural bridge, more or less, makes little difference. The state already has within its boundaries most of the known bridges and arches of any consequence in the United States. None the less, when one of unusual size comes to light it is at least a matter of interest. Such a span, and one which has received scarcely any publicity, stands in the southern part of the state in Zion National Monument, adjacent to much better known Zion National Park.

I walked in to see the bridge in 1951 and then tried to reach it by various routes, but soon found that the climbing was beyond what could reasonably be expected of a solo attempt. The top surface of the bridge is adjacent to, and continuous at both ends with, an extensive hanging shelf. This shelf, around its entire periphery, is isolated, either above or below, by towering sandstone cliffs. If one can reach the hanging shelf from any direction at all, the problem is solved.

In August of 1953, A. E. Creswell and I were in Zion National Park and, after inquiry at park headquarters, found that the bridge was still unclimbed so far as was known. A few weeks previously, two Philadelphia climbers, Victor R. Fritz and George H. Riley, had made an attempt, working out the major part of what is apparently the only feasible route. They turned back a little short of the objective because of the late hour.

On August 10th, after consultation with the staff at Zion Park headquarters, who made helpful suggestions regarding the approach route, Creswell and I decided to attempt the climb. We drove up the high-level road which goes northward from the town of Virgin toward Cedar City and, after about 13 miles,

turned off to the left, following a private road for an additional one and one half miles. The car was left at the end of this road, 1.2 miles NW. of Firepit Knoll,* in the late afternoon.

After some exploring, we located a very helpful cattle trail which begins near the end of the road. Following this trail, we walked through a low pass and continued gradually down into delightful Hop Valley, where a shallow stream meanders over a flat, sandy floor between high sandstone walls. About three miles below the pass, the trail leaves the stream bed in an inconspicuous fashion and gradually ascends a tree-covered slope on the left. This detour appears wholly illogical until one continues around the bend and finds that the canyon floor descends into a frightful chaos of great boulders and little cliffs. The visitor is well advised to desist then and there and return to the wooded slope.

Unfortunately the proper route up the wooded slope is by no means obvious to one arriving in the area for the first time. The cattle have shown considerable independence in developing devious side trails which lead to no objectives whatever. However, trail or no trail, if one forges steadily ahead well above and to the left of the stream bed he will eventually arrive at the crest of a ridge, though probably a little short tempered after tussling with dense scrub oak for half a mile. Such was the case with Creswell and me in spite of the fact that I had been over the ground two years before.

From the crest of the ridge we descended 400 feet to La Verkin Creek, which we followed downward for one or two hundred yards to the tributary stream draining southward from the canyon in which the bridge is located. It was now nearly dark. We made camp on the tributary stream near the junction.

All of the following day and the morning of the next we spent in exploring and trying various approaches, each of which eventually defeated us. Finally, about noon on the second day, we pushed up a gully which we had previously rejected because of its wild appearance and began to make real progress. Presum-

*Map: ZION NATIONAL MONUMENT, NORTHERN PART. Geological Survey, U.S. Department of the Interior. (Firepit Knoll is at the lower edge of the sheet.)

ably this was the route used by Fritz and Riley. We found one piton and three or four expansion bolt holes further up.

The gully is reached by proceeding north from La Verkin Creek up the tributary stream previously mentioned until the latter branches, nearly at the same spot, into three brooks. It is near here that the bridge first comes into view, suspended against a cliff 700 feet above.

From the triple junction we turned up the ridge lying between the left (facing upstream) and the middle brooks. After avoiding some initial cliffs by moving to the right, we zig-zagged up the ridge on its eastern side among trees, over steep slabs and through low cliffs. Up ahead a pillar rose against the sky in a V-shaped notch between two massive sandstone walls. The gully, which is the key to the ascent, lies between the pillar and the western wall. (On the map, this gully is shown lying immediately west of the middle brook.)

Where the gully emerges onto the slabs, it is in reality a small chasm and looks quite forbidding. Fortunately, about 150 feet below the base of the western wall, three trees have fallen across the gap in a tangle, providing access to a brushy, sandy ledge on the far side 25 feet away. After crossing over on the top-most tree trunk which is some 16 inches in diameter, we scrambled left up the steep sandy ledge, clinging to tree roots in the loose sand to keep ourselves from sliding off altogether. After 40 feet, we attained the bottom of the gully where it leveled off somewhat just above the deep section spanned by the fallen trees.

From here, we continued up the narrow, brushy passage until we reached a steeply rising cleft, wet, mossy, and dimly lighted inside. High overhead, a great angular chockstone jutted out, over-riding everything. We queasily started up the cleft but were surprised to find good holds on the left wall, though they were a little slippery in spots. After 150 feet, our heads bumped into the chockstone and we stopped. We were in a veritable cave.

We faced about and, now looking outward, saw on our right a foot-wide slot between subsidiary chockstones. Turning speleologists for the moment, we squirmed through the opening, pushing our packs and ropes ahead of us. After crawling on all fours through a short tunnel, we emerged onto a ledge some distance

CRESWELL LOWERING A LINE DOWN THE BACK WALL OF THE ARCH

in order to measure the thickness. (Line is not visible in photo.) Rope tied round Creswell's waist anchors him to tree.

Photo, F. D. Ayres

TAKING A COMPASS BEARING

on the south end of opening between the span and the hanging shelf. More of the shelf is visible in the background.

Photo, A. E. Creswell

RIDGE BETWEEN THE TWO BRANCHES OF THE GULLY

Photo, A. E. Creswell

TAKING A COMPASS BEARING

on the south end of the opening between the bridge and the shelf.

Photo, A. E. Creswell

out from the back of the cleft. The great chockstone still soared out above us.

The route was becoming rather airy. After roping up, Creswell stepped up three feet onto a rudimentary ledge and moved outward along the wall. We noticed that our predecessors had used expansion bolts here, but we were able to avoid them by driving angle pitons into an overhead crack. With these as security, Creswell advanced far enough along the wall to haul himself up past the chockstone.

Once past this obstacle, we climbed quickly through brush and boulders for several hundred feet to a point where the gully divided into two branches. The east branch was larger and filled with trees and brush, the west was shorter, steeper, and mostly bare sandstone. We chose the ridge between the two branches, relying on friction and four reasonably solid pitons for the first 120 feet. Initially the slope was about 50 degrees, but it gradually eased off and the ridge merged into the surface of the hanging shelf at a point about four tenths of a mile NNE. of the bridge.

We were up. We quickly walked over a gentle swell in the shelf, down into a shallow valley and up again to our objective. The bridge is big. Only from the shelf behind it can one get the full impression of its massive sweep. From all other directions the effect is diminished by the adjacent cliff. Perhaps some observers would object to calling it a bridge at all, since it does not stand boldly free in the manner of Rainbow, Owachomo, or Sipapu bridges, for example. Creswell and I accepted it as it is—a big arch with a lot of air around it.

The Park Service wanted to know the approximate dimensions of the bridge and so did we, but there was no time to make measurements then. Our excessively long preliminary explorations had used up too much time, and all our food as well. We hurried back down to our camp near La Verkin Creek, packed up and continued on out, arriving at park headquarters at 9:30 that evening.

In order to make the measurements, we returned two days later, on August 14th, and started in from the car at 4:55 A.M. Now quite familiar with the route, we arrived on top of the

bridge at 10:45 and set to work at once. From a point on the front top surface, approximately over the center of the arch, we lowered a two-pound fragment of sandstone attached to a long stout cord until contact was made far below. The process was repeated at the back of the bridge. The cord lengths gave figures which might be interpreted as heights. Actually, the term "height" does not have much significance in the case of this bridge. A rock dropped from either the front or the back lip would, after falling a considerable distance, strike the face of a cliff and bound on down another two or three hundred feet.

Again working near the center, one of us lowered a weight down the back wall of the arch while the other observed from the shelf and reported when the weight reached open air. This gave the vertical thickness at the center. The undersurface of the span is sharply beveled from front to back. The two extremities of the long slot between the arch and the hanging shelf were inaccessible, but the distance between them was determined by taking parallel compass bearings on each and then mesauring, along the top surface of the bridge, the distance between the two sightings. The top surface of the bridge slopes downward from south to north at an average angle of about 20 degrees. This was taken into account in calculating the horizontal length of the opening, the latter being a little less than the distance between our sightings as measured. The final figure may be called the "span" of the arch.

The transverse distance across the top surface of the bridge varies somewhat. We made a measurement over the center of the arch. The distance from the shelf out to the back face of the arch was estimated by use of the range finder on one of the cameras, a very approximate measurement of course.

These measurements, which required no small amount of climbing, some of it roped, kept us busy until 2:30, at which time we started down, spurred considerably by a rapidly approaching thunderstorm. This time we descended to the gully by way of the west wall of its west branch, opposite the base of the dividing ridge. As a matter of fact, this probably would be an easier route of ascent than the one we used on the nose of the ridge dividing the two branches. The car was regained at 6:30.

Our measurements, which are believed to be conservative, are tabulated below:

Height to top surface, measured in front	330 feet
Height to top surface, measured at back	240 feet
Vertical thickness, measured at back	80 feet
Transverse width at center	65 feet
Distance out from shelf	50 feet
"Span"	about 290-310 feet

For comparison, the lengths of a few other large spans, all in Utah, are listed below:

Name	Location	Span in feet
Landscape	Arches National Monument	291
Rainbow	Rainbow Bridge National Monument	287
Sipapu	Natural Bridges National Monument	261
Kachina	Natural Bridges National Monument	206
Owachomo	Natural Bridges National Monument	200
Double Arches (larger)	Arches National Monument	163
Broad Arch	Capitol Reef National Monument	133
South Window	Arches National Monument	130
North Window	Arches National Monument	98

Summary of Statistics

ASCENT: Natural bridge, Zion National Monument, Utah; first ascent, August 1953.

PERSONNEL: Fred D. Ayres and A. E. Creswell.

Field Research and Expeditionary Mountaineering

ROBERT B. FORBES
Department of the Army Expedition Project Supervisor

In recent years, American mountaineering parties have become increasingly active in the remote or unexplored mountain ranges of the world. The logistical planning necessary to approach and initiate a final assault on peaks located in such areas is often of considerable scope and complexity. Major efforts of this type are well known to the reader and in this discussion are defined by the writer as "Expeditionary Mountaineering."

Many of the mountainous areas entered by these expeditions have never before been explored by educated man and hold unlimited potentialities for scientific research. Yet, in many instances, climbing groups for various reasons of expediency attempt the mountain and then retreat, giving the surrounding area little more than a cursory examination. Diaries or notes kept by expedition personnel may record observations made of the geology, weather, high-altitude effects, or the culture of the natives encountered en route. Information of this type is of considerable interest to the recreational reader, but unfortunately of little value as a source of data for the scientist. Criticism of this deficiency should not be directed toward the mountaineer, for he is a dedicated individual, primarily concerned with climbing a mountain. His objective has usually been additionally narrowed by financial or circumstantial privation endured in order to make the trip. There have been exceptions, of course, as outstanding research contributions have been made by qualified individuals and groups. It is informative to note, however, that most of these outstanding expeditionary research contributions have resulted

from well-planned research programs skillfully integrated into the climbing effort and often implemented by European or Asiatic climbing groups.

A very real cause for concern is the growing stigma attached to American expeditions primarily concerned with mountaineering but including research as an associated activity. In recent years responsible research personnel and scientific groups have come to view the quality of research done on such expeditions with decreasing confidence. There is good reason to believe that the distrust voiced by these agencies is justified. Leaders of prospective expeditionary climbing groups have found it increasingly difficult to gain support from government or civilian research agencies and have occasionally been informed that the group was not considered capable of supporting the quality of research encouraged by that agency. This attitude may often cause indignation among expedition personnel. Many of those concerned may be well qualified in a research field. However, a denial of this kind is usually not associated with a lack of confidence in the research ability of the group, but is born of concern that they will not have the opportunity to utilize it. The mountaineer-scientist who is a member of a party assaulting a difficult mountain will find himself severely taxed to divide his efforts between climbing and research responsibilities. This is particularly true of the individual who is a member of a team which demands the ultimate in physical effort and alertness to insure the safety and success of the climb. The man who measures dip and strike of strata when he should be belaying, or writes up field notes instead of pitching the tent, is of course a burden, and can be a hazard. Conversely, the climber carrying his just share of responsibility in a major effort will find little time for the exacting field work necessary for accurate scientific field research.

Does this mean that science and mountaineering are incompatible? If one were to gauge the answer by the inferior research done by some groups and the exclusion of research activities by others, including the proclamation of one group that "No damn science" was the expedition by-word, the answer would be yes. The writer agrees that it is better to forget research if it interferes with the efficiency of the climbing team, and if the research

is of such an inferior nature as to bring adverse criticism upon the group. To exclude field research from such an effort is probably of benefit to both the climbers and the scientific world.

Those of us who have been involved in an expeditionary effort are fully conversant with the vast amount of clothing and equipment, the transportation costs, and other requirements which quickly mount to sums far beyond the reach of most individuals. Outside support is usually a necessity. Therefore, it would be well to consider the difficulties of obtaining support of such efforts and the most constructive and available source of this desired help before widening the growing gap between science and mountaineering. Publicity, while desirable, can be somewhat disconcerting when used as a supporting medium. Most press agencies support such an effort with an accent on danger and make a point of illustrating the hazards and tragedies with great vividness. In contrast to the current A.A.C. efforts to minimize accidents and forestall the growing public opinion that mountaineers are a group of wild men with a strong death wish, this type of commitment frequently ricochets back on the party. If there is a choice between alliances, it would seem apparent that scientific research offers a much better opportunity for a lasting contribution and an accompanying accolade from the public.

During the last thirty years, mountaineering has become increasingly popular, and on a global basis there are large numbers of competent mountaineers. Many of these possess considerable technological ability and in some cases are noted men in their fields. To these men as well as the recreational mountaineers, the opportunity is offered for reinstituting mountaineering as a vehicle for field research. Because mountaineering expeditions are usually active in remote regions, their sphere of operations generally coincides with areas of scientific interest. The hardships and technical difficulties encountered in such a region demand that the researcher be trained in travel or survival in a mountainous environment. To the science-mountaineer, then, opportunities are limitless, and with proper organization, both he and the recreational mountaineer can accomplish their aims.

An analysis of past expeditions contributing high-quality research indicates that in most cases there were two separate and

distinct groups within the effort, the research group and the climbing group. Both groups operated out of a common base camp and often under the direction of separate field leaders. The climbers climbed, and the researchers researched. This was the key to the success of each one of the expeditions concerned. Research personnel were also competent mountaineers and competent to travel without assistance from the climbing group.

Considerable attention should be given to the fact that a group of this type constitutes a powerful mobile reserve capable of offering emergency assistance when mishaps occur to the climbing party. On several occasions in the past, such a reserve has been instrumental in preventing the loss of climbing parties who had become exhausted or injured in the assault.

The advantages of such an organization are numerous. An effort of this type possesses great strength and provides a margin of safety not attainable by small mountaineering groups dedicated solely to climbing.

The same criteria should apply to the formulation of the scientific groups as that governing the selection of a strong climbing team. Members of the research group should be evaluated carefully for previous expeditionary experience, group compatibility, as well as research ability. Contact among the members of the research team should be established well in advance of the actual departure. The prior planning necessary for the proper implementation of a coordinated research program is of necessity quite extensive.

The manpower requirements of an expedition of this scope are of course heavier than those of a pure climbing party. Consequently, the logistic difficulties will be greater. Technical equipment, tentage, communications, subsistence, and transportation requirements will assume additional importance.

The mountaineer may immediately become concerned over these additional responsibilities, having been victimized on previous expeditions in which "going heavy" so hampered the group that the climbing effort was sabotaged by housekeeping or supply activities. Such concern is justified, since many indeed are the mountaineering parties which have been defeated by overpowering logistic difficulties.

Therefore, in the interests of efficiency, supply responsibility

should be delegated away from the climbing and research groups. The curse of supply responsibility can be just as fatal to a research program as to a climbing effort. The record indicates several research fatalities from the logistic menace. To avoid this difficulty, there should be a supply group, distinct within itself and without the duality of responsibility so often a threat to the effective implementation of both major efforts.

The writer sincerely hopes that the preceding discussion will stimulate the expedition mountaineer to seriously reconsider the opportunities offered to properly implemented expeditions which earnestly desire to support reliable scientific research.

Expeditionary efforts which support and fulfill research obligations in a scientific manner will bring credit to the mountaineering fraternity and gain increased support from agencies active in field research.

• *The American Alpine Club Research Fund was established in 1945 to promote scientific, literary, educational, or historical research and publication related to mountaineering, geology, or geography. The members appointed to the Research Committee by the President are William B. Osgood Field, William R. Latady, Christine L. Orcutt, Chairman.*

American Alpine Club Research Fund

REPORT OF THE COMMITTEE, 1952-1953

Because of unforeseen circumstances beyond our control the Research Committee's plans for the implementation of an Equipment Symposium were necessarily postponed. It is only during the past three months that your Chairman has been free to concentrate on the problems and opportunities such a program will provide.

It is our belief that members of the American Alpine Club because of their widespread activities in many fields of science related to mountaineering, and in mountaineering itself, have a wealth of experience and first-hand knowledge of equipment items which it is hoped that this Equipment Symposium can correlate and make available to all.

The prompt and full cooperation of all our members is necessary for the successful implementation of this program. We invite your recommendations. Correspondence should be addressed to: Christine L. Orcutt, Chairman

The American Alpine Club Research Committee
93 West Cedar Street
Boston 14, Massachusetts

We regret that because of space limitations in the *American Alpine Journal,* 1953, the map showing "Surface Features of Dinwoody Glacier, Wind River Mountains, Wyoming," by Mark F. Meier was omitted. Publication of the map, separately, is anticipated in time for inclusion with the 1954 edition.

TO USE OR NOT TO USE OXYGEN

On 2 June 1953 Sir Edmund Hillary and Sirdar Tensing Bhutia, equipped with open-circuit oxygen sets, reached the summit of Mount Everest, the world's highest mountain, altitude 29,002 feet. On 12 December 1953 Major Charles E. Yeager, U. S. A. F. and Assistant Chief of the Air Force Flight Test Center, Operations Laboratory, Edwards Air Force Base, Mojave Desert, California, wearing crash helmet, pressurized G-suit, and oxygen mask, was borne aloft by a B-29 mother ship, released, and then rocket powered to about 70,000 feet, at which height, in his Bell X1A jet plane, he attained the record speed of 1,650 m.p.h.—Mach. 2.5, two and a half times the speed of sound. On 15 February 1954, French Naval Commanders Pierre Wilm and George Houot descended 13,282 feet to the ocean floor off Dakar, Africa, and remained there for 5½ hours in their yellow steel bathyscaphe which had been pulled down to this record depth by heavy weights stuck to the cabin by electromagnets. In each of these record achievements oxygen played an important role, and but for oxygen, the high-speed flying and ocean depth records would not have been possible. And what of Everest?

It is not possible to discuss all phases and aspects of this question in the space available, nor may one claim to be an authority on the subject in three months time. Those who are concerned with this problem cannot do better than to study the pros and cons in regard to the use of oxygen for high-altitude mountaineering as they have been so clearly and objectively set forth in that magnificent summarization of 30 years of Himalayan mountaineering, *The Ascent of Everest* by Brigadier Sir John Hunt.

On 18 February 1954, the California Himalayan Expedition to Makalu (27,790 feet) left Travis Air Force Base under the leadership of Professor William Siri, physicist at the University of California.

Other members of the party are Dr. Nello Pace, Professor of Physiology, U. C., who will provide medical assistance in the extreme cold and high-altitude conditions to be encountered; Dr. Bruce Meyer, Dr. Lawrence Swan, Richard Houston, Fritz Lippman, William E. Long, William Unsoeld, and Allen P. Steck.

In the meantime the following selections from our Research Committee Mail Bag will be of interest—if not the final answer.

February 14, 1954

GENERAL NATHAN F. TWINING
Chief of Staff
United States Air Force
Washington, D. C.

Dear General Twining:

The PROBLEM I wish to solve boils down to one question: "Where can oxygen masks and oxygen cylinders be obtained which are suitable for ascents of mountains exceeding in altitude 21,000 feet? See *The Ascent of Everest* (British Edition) or *The Conquest of Everest* (U. S. Edition) by Brigadier Sir John Hunt (copy forwarded under separate cover) Chapter II—The Problem; also Appendix V and Appendix VII.

If open-circuit and closed-circuit sets are procurable only through the U. S. Air Force, is there any possibility of two or more sets being made available to members of the California Himalayan Expedition to Makalu (27,790 feet) for high climbing tests?

Members of the Makalu Expedition '54 are scheduled to leave San Francisco in groups on or about February 20. Their supplies and equipment are already on the high seas en route to Calcutta, according to a letter received here recently.

If procurable through the U.S.A.F. it is my understanding that such masks must be adapted to climbing needs and carefully fitted to climbers. Could the masks be procured from an Air Force Base in the vicinity of San Francisco *to save time* and transportation expenses?

If not procurable for Makalu, the time factor is no longer pressing—but the PROBLEM will be recurrent since this country and many of our Allies are establishing Himalayan Foundations for the purpose of High Altitude Research in many fields of science.

Your assistance would be deeply appreciated,

CHRISTINE L. ORCUTT, *Chairman*
The American Alpine Club Research Committee

Department of the Air Force
OFFICE OF THE CHIEF OF STAFF
United States Air Force
Washington, D. C.

26 February 1954

Dear Mrs. Orcutt:

I have received your letter of 14 February, which I referred to our Materiel people for their consideration. You should be hearing from them in the near future.

Thank you for the copy of *The Conquest of Everest,* I enjoyed it very much and appreciate your thoughtfulness.

Sincerely,

N. F. TWINING
Chief of Staff, United States Air Force

Department of the Air Force
HEADQUARTERS UNITED STATES AIR FORCE
Washington 25, D. C.

1 March 1954

Dear Mrs. Orcutt:

Your letter to the Chief of Staff of the Air Force, dated 14 February, has been forwarded to our office for answer. As you know the Air Force is one of the sponsors of the California Himalayan Expedition to Makalu and arranged for their transportation on 18 February from California to India by military air transport aircraft.

During the preparatory phase of the Expedition, Air Force oxygen equipment was offered to Mr. William Siri, the leader of the expedition, and to Dr. Nello Pace, its scientific director. After careful consideration of the advantages and disadvantages and due to the excessive weight and size of the gaseous cylinders involved, Mr. Siri elected not to use our oxygen equipment.

The key to the success of the oxygen equipment used on the Hunt expedition to Mt. Everest was their use of aluminum high-pressure cylinders. This type of cylinder is not made in this country and there was insufficient time for Mr. Siri's group to purchase the equipment from England.

The Air Force and the Navy have both contributed technical equipment to the Makalu expedition which, we hope, will contribute to the success of the expedition.

Your interest is greatly appreciated,

Sincerely yours,

A. P. GAGGE, *Colonel, U.S.A.F.*
Chief of Human Factors Division
Directorate of Research and Development

From the Department of Metallurgy, Massachusetts Institute of Technology, we have learned that to manufacture oxygen cylinders of drawn dural tube (duraluminum is preferable because of its light weight, great strength, and hardness) such as were used on Everest, specially shaped tools, heavy power presses, and a forger skilled in the knowledge of how to make the grain of the metal flow in the right direction are essential to the forging of a gas cylinder capable of holding some 800 litres of oxygen at a pressure of 3,300 p.s.i. This process is extremely expensive, and for aviation purposes considered at present unwarranted.

Through the courtesy of Captain Harry Sartoris, U. S. N., Commanding Officer, South Weymouth Naval Air Station, Mass., Licutenant Gustave H. Shubert, U. S. A. F., Base Personal Equipment Officer, and Mr. Thomas C. O'Donald, Foreman, Base Operations Branch, Base Personal Equipment Section, 6520th Air Base Group, Lawrence G. Hanscom Field, Bedford, Mass., and Lieutenant Richard Mason Bellinger, U. S. N., Harvard University R. O. T. C. an examination of the several types of oxygen masks available through the United States Air Force and the United States Navy—Demand Masks, Pressure Demand Masks, and Continuous Flow Masks—was made possible. Once again were revealed the ingenuity and skill necessary for the production of the Oxygen Breathing Assault Sets designed by the British for Everest and manufactured by Normalair, Ltd.

In place of the rubber rebreather bag common to both R. A. F. and U. S. A. F. closed-circuit sets, which Hunt suggests may prove to be the better type for climbing purposes (See *The Ascent of Everest*, page 262), but which when worn unmodified, would have been comparable to climbing with an inflated bal-

loon bobbing about under one's nose, and always in danger of being punctured at any moment, the rebreather bag and container for its protection were placed on the Everest carrying frame. For the open-circuit sets, at Tom Bourdillon's suggestion, the bottles (cylinders) and an economizer were placed there too.

Since no oxygen masks, cylinders, or carrying frames light enough, or in other ways suitably adapted to high-altitude climbs, are available in the United States, we contacted Messrs. Normalair, Ltd. of Yeovil, Somersetshire, England, who are specialists in high-altitude aviation equipment, in regard to the availability of their oxygen equipment, and prices. Their reply is as follows:

NORMALAIR, LTD.
Yeovil, England

12th March, 1954

Dear Mrs. Orcutt.

Thank you for your letter dated the 7th March and copies of the correspondence on the Everest oxygen equipment.

We much appreciate your comments, and enclose with this letter such literature and photographs as we have immediately available.

We have also been in touch with the "Times" newspaper (Mr. Astor) who, I understand, will be sending to you today some photographs of the advertisement which appeared in their Mount Everest supplement.

As regards the actual bottles and other items, the equipment for the British Everest expedition was all made as a special venture and I am sorry that we have none of it in stock or in production.

It was slightly out of our normal run of activity and we had, up to that time, primarily been concerned with aircraft equipment, so I hope you will excuse us from quoting prices for the supply of those items.

We are, however, at the present time engaged in the design and development of certain oxygen breathing sets specifically for climbing use, and we should like to send you information on such equipment when we have reached the point of having something definite to offer you, which should be later on this year.

May I once again thank you for your kind remarks and say that we should look forward to keeping in touch with your Committee on such matters. If there is any further information you would like to have on the 1953 Everest equipment, please do not hesitate to ask us.

Yours sincerely,

for NORMALAIR LIMITED
Commander F. W. N. BASSETT
Commercial Manager

In regard to the physiological aspects of oxygen use we have the following statement from Dr. Charles S. Houston, leader of the Club's expedition to K2, 1953, and member of the Club's first expedition to K2, 1938.

AMERICAN ALPINE CLUB
Third Karakoram Expedition
K2 1953
March 10, 1954

DR. CHARLES S. HOUSTON
ROBERT H. BATES
Exeter, New Hampshire

(excerpt)

So far as oxygen is concerned my feelings can be summarized as follows: I am satisfied that *well acclimatized men,* given proper weather, good health, and proper support, can reach 28,250 feet without oxygen. Please note the emphasis on well acclimatized men. Whether or not the summit of Everest can be reached without oxygen I am not so certain. Physiologically it is possible; practically it may not be. I have no particular feelings about the sporting aspects of using oxygen.

So far as the technicalities of oxygen equipment are concerned I am not sufficiently up-to-date to be very helpful. In general I favor the open system, because of the weight factor, and the certainty of pure oxygenation with atmospheric air sufficient to bring the climbers to an altitude of 10 or 15 thousand feet only. Our Air Force, Army, and Navy, have an excellent regulator called the Diluter Demand, which comes in various forms and which is quite light. It has not been used in the mountains to my knowledge. A rig of cylinders and Diluter Demands, together with some type of oxygen mask, can be put together from present equipment weigh-

ing 22 pounds and to last about 5½ hours at 28,000 feet. We took two sets to base camp, but took them no higher. They were obtained through the cooperation of the U.S.A.F. They can be obtained commercially from a company in California.

Unquestionably the light-weight cylinders made in England and Switzerland would be very helpful, and unquestionably would be worth obtaining. In my own book I would not plan to use oxygen on any mountain under the altitude of K2, and would take oxygen to K2 only because of the pressure of public opinion.

I am informed that sleeping is much better when climbers use oxygen, and it might be possible to use oxygen at night in order to insure a better rest. So far as accomplishments are concerned I think it is worth pointing out that Passang and his two companions climbed from Base Camp to Camp IV on K2 in one day without oxygen, a feat which is superior in fact to the great accomplishment of Hillary in the Western Cwm last year with oxygen. Also it is worth mentioning that Longstaff climbed 6,000 feet in one day up to over 23,000 feet without oxygen, being perfectly acclimatized.

Certainly the use of oxygen for peaks under 27,000 feet is foolish, and may lead to a good deal of difficulty. I would anticipate that a party which relied on oxygen rather than acclimatization might well lose personnel if trouble developed in the equipment or with the weather. I would strongly oppose the use of oxygen at any such altitude.

Sincerely,

CHARLES S. HOUSTON, M.D.*

For those concerned with the physiological aspects of high-altitude mountaineering we can recommend: Tufts College Institute of Applied Experimental Psychology, *Handbook of Human Engineering Data,* Second Edition (Revised), for the Special Devices Center, Office of Naval Research, Human Engineering Division, 1 November, 1952, Part VII.

The American Alpine Club Research Committee has been the fortunate recipient during the past few years of 45 most valuable and informative publications by or received from the following

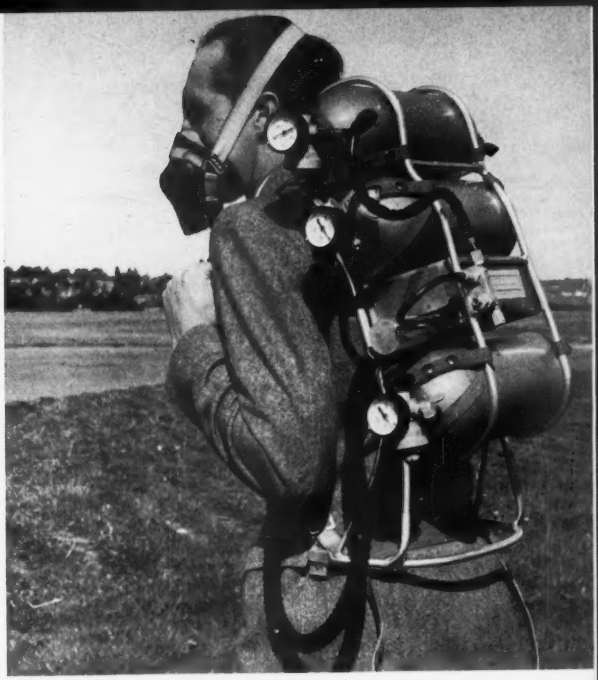
*FULTON, JOHN F. *Aviation Medicine in its Preventive Aspects* (Oxford Univ. Press, 1948. Univ. of London, Health Clark Lectures, 1947). Chapter I. *Altitude Sickness and Acclimatization:* History of Oxygen.
HOUSTON, CHARLES S. "29,000 Feet." *A.A.J.* VI, 181.

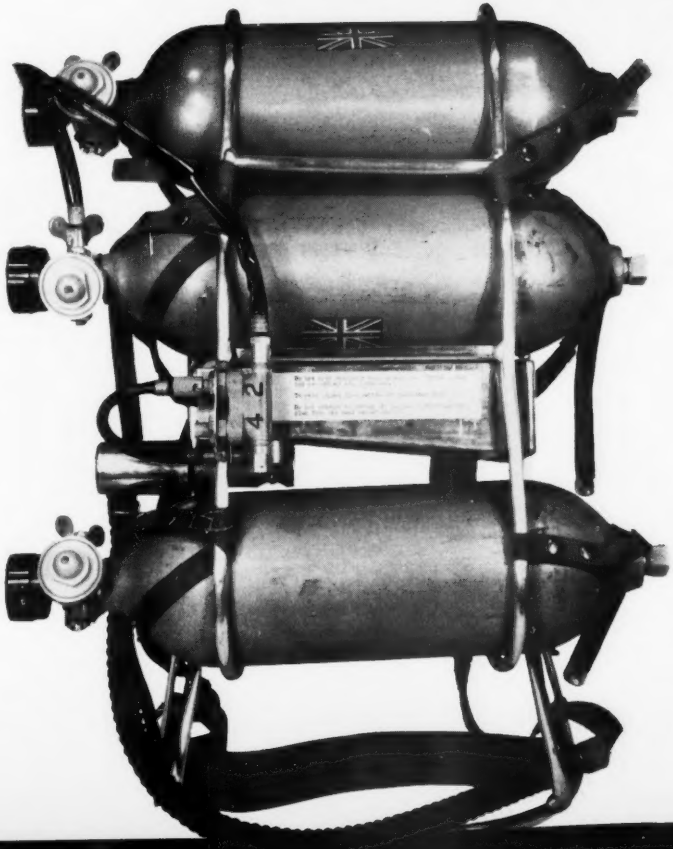
OPEN-CIRCUIT OXYGEN SPECIAL ASSAULT SET

The pack illustrated is of the type worn on the final successful assault of Mt. Everest. It consists essentially of up to three light alloy oxygen storage bottles carried in a special light tubular frame, an economizer to store the oxygen ready for use, and a manifold unit to allow a flow of 2 or 4 litres per minute to be selected. The whole pack weighs some 40 lbs. when fitted with three bottles fully charged and is carried on the back by means of webbing straps.

The bottles are charged to 3300 p.s.i.; each one containing the equivalent of 800 litres of free oxygen. Thus the complete pack has, theoretically, sufficient oxygen to last 20 hours when being used at the rate of 2 litres per minute, or 10 hours if the greater flow of 4 litres per minute is used.

Photos, courtesy Normalair, Ltd.





LOOKING ACROSS UPPER TAKU GLACIER

Aircraft on the glacier is the 10th Air Rescue Group SA-16
"Albatross" triphibian which lands on its hull.

Photo, R. Halmi, Juneau Ice Field Project

authors: Arthur Beiser, Cosmic Ray Group, New York University; the late Dr. Kirk Bryan, Geomorphologist, Harvard University; Dr. Donald B. Devoe, Tufts College for Applied Psychology, North Hall, Tufts College, Medford, Mass.; Joel E. Fisher, Director of the Cold Ice Tunnel Project on the Silbersattel, Monte Rosa, Switzerland; Joseph Kaplan, Chairman, United States National Committee, International Geophysical Year, author, Dr. Serge A. Korff, donor; Donald B. Lawrence, Associate Professor of Botany, University of Minnesota; Maynard M. Miller, Cambridge University; Dr. Robert L. Nichols, geologist, Tufts College, Mass.; Dr. Lawrence E. Nielsen, Monsanto Chemical Company, Springfield, Mass.; Captain Harry Sartoris, U. S. N. (donor), South Weymouth Naval Air Station, South Weymouth, Mass.; Dr. Robert P. Sharp, geomorphologist, California Institute of Technology; Dr. Phrixos J. Theodorides, Research Professor, Institute for Fluid Dynamics and Applied Mathematics, University of Maryland, to each of whom we wish to acknowledge our deep debt of gratitude and warm appreciation for their kind thoughts, well wishes, and generous cooperation.

William O. Field
William R. Latady
Christine L. Orcutt, *Chairman*

Scientific Notes

JUNEAU ICE FIELD RESEARCH PROJECT, 1953

The American Geographical Society administered another season of scientific study in 1953 on the Juneau Ice Field, southeastern Alaska, with contractual support given by the Office of Naval Research and the Departments of the Army and Air Force. First reconnoitered in 1948, the ice field has been used for glaciological and related research in successive summer seasons and during January—February, 1951. The project is a part of the Society's Glacier Study Program which has carried on investigations in Patagonia, in the Canadian Rockies, and elsewhere in coastal Alaska.

The 1953 party formulated its plan of study as a continuation of research carried through earlier seasons. Objectives were to accumulate additional facts concerning the behavior of Taku Glacier and related glaciers at the present time as well as during the past; to investigate further the nature of the ice field, such as its geobotany; to record the weather conditions at the research station (upper Taku Glacier) for a fifth season; to extend the triangulation survey to the western sector of the field; and to begin glaciometeorological studies on neighboring Lemon Creek Glacier which would be used for comparison with similar studies made on glaciers elsewhere in the world.

An eight-man team executed the above program during an 88-day field season extending from June to September.* Dr. Lawrence E. Nielsen of Springfield, Massachusetts, was leader of the field party. This included a meteorologist, plant ecologist, aerial photo interpreter, radio man, surveyor, mechanic, and

*More detailed reports by: Nielsen, Lawrence E., and others, may be found in *Progress Report Juneau Ice Field Research Project, Alaska, 1953*, American Geographical Society, New York.

camp manager. Later in the season, Maynard M. Miller led a party of four men to the upper Taku Glacier for additional field work. It is of interest that since the inception of the Juneau Ice Field Research Project in 1948, a total of 23 members of the American Alpine Club have taken part in the field work.

The 1953 season brought to a close a five-year concentrated study on Taku Glacier by the Project while at the same time it inaugurated the glacio-meteorological research on Lemon Creek Glacier. Taku Glacier will not be neglected entirely in the future. Periodic observations such as snow surveys and the photography of the trimlines and terminal areas will be continued. Emphasis has been shifted to Lemon Creek Glacier because of certain of its attributes. The glacier is easily delineated areally, is readily accessible on foot from Juneau, requires half the number of personnel in the study team, and because of its small size, can be investigated in its entirety. According to current plans, it is anticipated that Lemon Creek Glacier will be used as one of the representative glaciers of the coordinated studies to be undertaken during the International Geophysical Year (IGY) 1957-1958.

Calvin J. Heusser
Project Officer
Juneau Ice Field Research Project

THE INTERNATIONAL GEOPHYSICAL YEAR, 1957-58

In response to a request from the International Council of Scientific Unions, the National Academy of Sciences-National Research Council, in February 1953, formed a United States National Committee to develop a program of geophysical observations to be carried out by the United States during the International Geophysical Year 1957-58.

This United States National Committee, assisted by various working groups, prepared tentative proposals for submission to the Special Committee for the International Geophysical Year, which has been appointed by the International Council of Scientific Unions. These proposals, together with those prepared by national committees of other nations, were carefully studied at

the first meeting of the Special Committee held at Brussels, June 30th to July 3rd. At this first meeeting Dr. Sydney Chapman was elected *President;* Lloyd V. Barker, *Vice-President;* and Marcel Nicolet, *General Secretary.*

One of the tasks of the United States National Committee is to inform the scientific and general public of its purposes and plans, and it is hoped that during the long period of preparation and during the actual one and a half years of the program, factual and interesting accounts will provide the necessary background for a better understanding of the undertaking.

It is obvious that it will not be possible to cover all aspects of the vast field of geophysical studies during the IGY. The dates selected were designed to coincide with the expected period of maximum solar activity, and the eleven working groups at the Brussels meeting dealt with the following subjects: *i)* meteorology, *ii*) latitude and longitude determinations, *iii*) geomagnetism, *iv*) the ionosphere, *v*) aurorae and airglow, *vi*) solar activity, *vii)* cosmic rays, *viii)* glaciology, *ix)* oceanography, *x*) the selection and announcement of world days for specially intensive observations during the IGY, and *xi)* publication.

The United States National Committee for the IGY held its third meeting on November 5th and 6th in Washington, D. C., at the new headquarters of the National Science Foundation. Joseph Kaplan, professor of physics at the University of California and Chairman of the Committee, presided. Among the reports presented was one by A. Lincoln Washburn, Chairman of the Arctic Regional Committee and one of the American Alpine Club's outstanding authorities on Arctic research. After a discussion period the National Committee appointed a coordinating group to develop and draft the scientific program to be carried out by the United States. Members of this group were designated as reporters on specific portions of the program as follows: *World Days,* Alan Shapley, National Bureau of Standards; *Meteorology,* H. Wexler, U. S. Weather Bureau; *Magnetism,* E. B. Roberts, U. S. Coast and Geodetic Survey; *Aurorae and Airglow,* C. T. Elvey, University of Alaska; *Cosmic Rays,* Serge A. Korff, New York University; *Polar Activity,* Seth B. Nicholson, Mt. Wilson Observatory; *Ionosphere,* H. G. Booker, Cornell

University; *Longitude and Latitude,* G. M. Clemence, U. S. Naval Observatory; *Glaciology,* William O. Field, American Geographical Society; *Oceanography,* E. H. Smith, Woods Hole Oceanographic Institution; *Rockets,* J. A. Van Allen, Princeton University; and *Publications,* Executive Secretary of the United States National Committee.

Of particular interest to members of the American Alpine Club will be the glaciological and cosmic ray programs, for William O. Field, Dr. Serge A. Korff, and Dr. Terris Moore, President of the University of Alaska, with the assistance of the Office of Naval Research, the Office of the Quartermaster General, the U. S. Air Force, and the Regents of the University of Alaska, established the Mount Wrangell Observatory for cosmic ray and other affiliated scientific studies on the summit of Mount Wrangell, Alaska.

CHRISTINE L. ORCUTT

COSMIC RAYS AND MOUNTAIN OPERATIONS

Since about the year 1900 it has been known that even the most carefully insulated electroscope would slowly lose its charge. This effect was thought to be due to ionizing radiation from ubiquitous traces in the earth of radioactive minerals of radium, thorium, and uranium. In the year 1912, an Austrian physicist, Dr. Victor F. Hess, carried an ionization chamber aloft in a balloon in an effort to get away from the local effect. He found that the radiation *increased* as he went to higher and higher elevations and he postulated that these rays come from outside the earth. Later work indicated that the rays come from all directions, bearing no relationship to the positions of the heavenly bodies or the Milky Way, but seeming truly cosmic in origin.

From these first experiments of Hess to the present day a tremendous amount of research and ingenuity has gone into the ever-expanding field of investigation of cosmic rays. The primary radiation impinging on the top of the atmosphere is extremely energetic, being composed of atomic nuclei, mainly of hydrogen and helium, having a speed very nearly that of light. These nuclei collide with air atoms, causing extensive showers of nuclear, mesonic, electronic, and photonic debris. But the at-

mospheric absorption is such that at sea level the intensity is very low, being approximately one cosmic-ray particle per minute passing through a horizontal area of one square centimeter. The over-all energy the earth receives is thought to be roughly equivalent to that obtained from starlight.

In order to get above much of the absorbing sea of air so as to measure greater cosmic-ray intensities, laboratories have been established on numerous high spots in many parts of the globe. However, the earth's magnetic field has been found to have a filtering effect on the charged radiation, deflecting primary particles with low energies away from the equatorial region. The nearer the geomagnetic poles one goes, the lower is the minimum energy required for a primary particle to enter the earth's atmosphere. For some time Professor Serge A. Korff and his Cosmic Ray Group at New York University have felt the need of a station having both the desirable features of high elevation and location as far north as possible. The mountains of Greenland and the Canadian Northwest Territory are neither high enough nor easily accessible enough, and it was therefore felt that the best location for such a station would be found in Alaska. Consequently, pioneer work was carried out in April 1952 by Dr. Korff and Dr. Terris Moore, President of the University of Alaska and bush pilot extraordinary. They flew over various peaks in the Alaska and Wrangell ranges and chose 14,006 foot Mt. Wrangell, a dormant volcano, because of its proximity (43 air miles) to Copper Center, on the Richardson Highway, and because its snow-filled crater formed an extensive, nearly level field for aircraft landing, air-drop operation, and laboratory installation.

Both men were well qualified for this work. In 1951 Dr. Moore had flown personnel and supplies to a climbing and surveying party under Bradford Washburn. He had made numerous landings and take-offs at 10,000 feet on the Kahiltna Glacier, along the west buttress route to the south peak of Mt. McKinley. Dr. Korff has led many cosmic ray expeditions and is an internationally recognized authority on Geiger and proportional counters. Both Dr. Korff and Dr. Moore are experienced mountaineers. Dr. Korff has scaled El Misti in the Andes as well as

mountains in the Alps and our own Rockies. Dr. Moore has Western China's 24,900 foot Minya Konka to his credit, as well as Chimborazo in the Andes, and Mt. McKinley in Alaska.

After the better part of a year devoted to preparations and plans, the mountain group assembled in early June 1953 at Copper Center, a small town about 150 miles northeast of Anchorage. Besides Dr. Korff and Dr. Moore, the group included Philip Bettler and Charles ("Bucky") Wilson, physicist at the Geophysical Institute of the University of Alaska, Robert Goodwin of Anchorage, an experienced mountaineer who had scaled Mt. McKinley in 1952, Arthur Beiser and the author, both members of the N. Y. U. Cosmic Ray Group. Bettler and Beiser had been particularly active in expediting the reams of paper work involved in setting this project in motion. Most valuable assistance was also given by Robert Haymes of N. Y. U., Lieut. Sidney Morris, U.S.N.R., and by Capt. Robinson Bridges, O.Q.M.G.

Since an airplane of this type* had never before, to our knowledge, been successfully landed and taken off at a 14,000-foot elevation, it was deemed advisable to have a ground party at the summit before the first landing was attempted. A suitable snow shoulder was chosen west of the summit at 8,500 feet elevation, and Dr. Moore ferried equipment and personnel there, 300 lbs. per flight. After three days of snowshoeing (most of one day was spent sitting out a storm), the climbing party reached the top and Dr. Moore performed the first successful landing. During the following operation of a month and a half this feat was repeated three dozen times with passengers and equipment. The Piper Super-Cub with a 135-horsepower engine is well suited for these extreme conditions.

Several days after the establishment of the mountain-top camp, two great air-drop operations were carried out. Fifteen tons of fuel, food, and equipment were released on parachutes from a giant cargo plane. Included in the drop were two prefabricated Jamesway huts, gasoline drums, motor generators and converters, canned food, lumber, plastic sleds, and other equipment. The plastic sleds for moving heavy cargo proved to be among the

*A Piper Super Cub, equipped with ski-wheel combination landing gear.

most useful items on the mountain, being rivalled only by snowshoes, snow shovels, and sun glasses.

The next five weeks were spent in setting up the two huts on a cinder ridge kept free of snow by volcanic steam and in digging out dropped equipment which was constantly being snowed under. Other work included towing loaded sleds across the great snowfield to the building site, constructing furniture, and improving interior facilities while violent storms raged outside. Though the mean air temperature hovered at about 150°F., there were some mild, windless days when one could walk comfortably without a shirt. Five degrees below zero was the coldest recording during storms. The weather on the summit during the summer was found on the average to permit five flying days per week.

The present station consists of two Jamesway huts. The larger one, 16 feet by 16 feet, has four bunks, two book or utility shelves, a table, a space heater, and a gasoline cook stove. The smaller hut, with a floor area of 16 feet by 12 feet, houses the motor generators and converters. Additional electric power from a wind-driven generator will soon be available for charging batteries. Also available are three radios: one all-wave receiver, a small aircraft transceiver for emergency communication with the C. A. A. monitoring station at Gulkana, and a walkie-talkie set with which to advise people at Copper Center as to the weather on top and as to the feasibility of landing the plane.

The establishment of this station was time consuming beyond initial expectations and limited scientific work to making meteorological observations, exposing nuclear emulsions to the local cosmic radiation, and testing clothing and equipment. It is hoped during the summer of 1954 to install and operate cosmic ray recording apparatus, as soon as the electric power supply can be sufficiently stabilized. Investigations in high-altitude biology, volcanology, meteorology, and materials research on clothing, housing, and performance of machinery are all feasible from this station. Moreover, its location is well suited for arctic indoctrination courses.

Before leaving the station in early August, Messrs. Goodwin, Bettler, Wilson, and the author climbed the four individual

peaks of which the summit is composed and which rise 200 to 400 feet above the great snowfield. From one of these we could look directly down into the great steam jet of the presently active side crater. On another peak we found a long, steep red clay bank, kept free of snow by volcanic steam and embellished by curious worm-like ice crystals. Here we found lichens growing on steam-warmed rocks—quite a surprise so far north at 14,000 feet elevation!

In summary the 1953 Mt. Wrangell operation resulted in a new northern high-altitude research station, and showed that the establishment and operation of such a laboratory on inaccessible mountains is both possible and practicable with the aid of aircraft.

HUGO A. C. NEUBERG
Physics Department
New York University

EDITOR'S NOTE: Mr. Neuberg, a member of the New York University Cosmic Ray Group, has carried on scientific research on expeditions to the Rocky Mountains, Alaska, Greenland, and the Galapagos Islands.

OCCURRENCE OF TWISTERS ON MOUNTAIN RIDGES

1. OBSERVATIONS

Twisters of great intensity were observed during an ascent of the Watzmann, a mountain in the northern limestone belt of the Alps, south of Berchtesgaden, Germany, on August 1st of this past summer.

The ascent of the Watzmann was made from the North by way of the Watzmann House (5,500 ft. altitude), from which point, already above the tree line, a sharp ridge rises to the Hocheck (8,000 ft.). Beyond this peak the ridge remains essentially horizontal for some 1,000 yards, then descends again to 6,000 ft. Consequently, this ridge, essentially straight, extending in a north-south direction, flanked toward the west by a great and rather smooth-sloping shelf of bare rock and toward the east by a precipice of many hundred feet, resembles a shed roof of rather symmetrical lateral profile.

On the day of the ascent, a fairly steady wind was blowing from the west, i.e., normal to the extent of the ridge and up

the western slope. The wind velocity at the ridge was perhaps 20 to 30 miles, varying but slightly with the onsurge and departure of clouds.

As the upper part of the ridge was approached, occasionally, at intervals of about 10 minutes, a great noise was heard, as from a falling avalanche. Soon it was found that this noise arose from local twisters which occurred right on the ridge and toward the lee of it. The intensity was so great that rocks as large as chicken eggs were lifted up and strewn about. Local wind velocities quite in contrast to the steady wind were so high that it was not considered safe to proceed along the crest of the ridge close to the precipitous eastern slope. Equally impressive as the intensity and the turmoil of this phenomenon was the suddenness of its occurrence and disappearance.

2. INTERPRETATION OF THE PHENOMENON

It appears quite plausible that the sudden occurrence of twisters, as observed along the Watzmann ridge just north of the Hocheck, is related to the formation of vortices arising at the point of separation of the air stream approaching the mountain ridge essentially at right angles. If these vortices are of the nature of a Theodorsen horseshoe vortex, a fact which eluded observation but which, by the shape of the mountain ridge, is well within possibility, then the great increase of local wind intensities within the twister may well be explained by the stretching of the horseshoe vortex and the consequent increase of vortex velocities.

The occasional occurrence may very well be related to a veering of the direction of the wind.

JOHN R. WESKE

EDITOR'S NOTE: Dr. John Weske is at present holding the position of Visiting Research Professor at the Institute for Fluid Dynamics and Applied Mathematics, University of Maryland. He has carried on research in experimental turbulence for the National Advisory Committee for Aeronautics. His discussion of twisters on mountain ridges appears to agree with and constitute an integral part of Dr. Theodorsen's theory, explained in the latter's *Mechanism of Turbulence, Proceedings of the Midwestern Conference on Fluid Mechanics,* Ohio State University, 1952.

Dr. Phrixos J. Theodorides, Research Professor at the Institute for Fluid Dynamics and Applied Mathematics, University of

Maryland, and A. A. C. member since 1951, in transmitting the above note writes:

Dr. Weske is a friend and colleague of ours at the Institute. His remarkable observations are corroborated by a similar pattern of wind flow past mountain ridges which I had noticed myself in Greece under extraordinary conditions.

It was in the 1920's. We were aloft in a direction SE. to E. of the Mount Olympus Range—highest elevation 2918 meters (Pantheon-Mytika), flying in a heavy windstorm that was blowing mainly from N. or NW. Our airplane, a Handley Page airliner of Imperial Airways (predecessor of B.O.A.C.), was struggling to keep on schedule for the first regular airmail from India to London, though adverse weather that day had actually downed even the military planes. Aboard the plane were the pilot, an experienced flyer who had previously flown the first airliner from London to Paris, the engineer, and three invited official guests, Sir Oliver Harvey, Counselor of the British Legation in Greece, with Lady Harvey, and myself, at the time Consultant of Aeronautics to the Government of Greece.

Unfortunately, my notes and sketches on that remarkable flight have joined a host of other losses during the ordeals of World War II. Yet, as far as my memory goes, I can state that the extraordinarily strong down currents which we met in the wake of Mount Olympus reflected clearly a pattern of flow similar to the outer region of a big horseshoe vortex, as set down in Dr. Th. Theodorsen's new theory of turbulence.

Proceedings of the Club

SECRETARY'S ANNUAL REPORT

5 December 1953

My first year as Secretary has been highly educational and I have been greatly helped during this breaking-in period by two former Secretaries, Henry S. Hall and Bradley B. Gilman. One thing is evident, however: the amount of Club business has so greatly increased that it must be handled as systematically as possible if it is to receive prompt attention and efficient action.

At the time of the last Annual Meeting the membership stood at 431 Active Members and 5 Honorary Members who were not also Active, or a total of 436. Not including applications approved by Council at its meeting of this date, our membership today comprises 439 Active Members and a total of 445, including both Active and Honorary Members. This net increase of 9 has been achieved despite the increase in dues and the fact that the Club lost 7 members by death, 8 by resignation, and 2 because of non-payment of dues. Twenty-five Active Members were elected and Maurice Herzog was made an Honorary Member.

Since the date of the last Annual Meeting the Club has lost by death the following: Edward V. Huntington, November 25, 1952; Donald Winchester Brown, December 21, 1952; Lewis Sherrill Bigelow, February 15, 1953; Richard L. Burdsall, February 21, 1953; J. Henry Scattergood, June 15, 1953; Henry Sturgis Grew, July 20, 1953; Arthur K. Gilkey, August 10, 1953; and Merl Lavoy, December 6, 1953.

Meetings of the Directors have been held in New York on March 14 and May 23; in Barre, Massachusetts, on October 3; and in New York, December 5. Section meetings have regularly been held by the Sierra Nevada and Cascade Sections, with William E. Siri Chairman of the former and Ralph W. Johnson the recently elected Chairman of the latter. Informal meetings and teas have been held at the Clubhouse monthly and sometimes more often; all these have been well attended. Recent guests have included Sir Edwin S. Herbert, President of The Alpine Club, and Sir Arnold Lunn. The most unusual and successful meeting of all was the K2 send-off party attended by about 100 persons on May 23 when, because of the last-minute closing of the restaurant where the dinner was to have been held, the Club House staff, nobly assisted by local members, served an excellent dinner for about 70 persons in the Club House itself.

Under William O. Field's supervision the Clubhouse has been well maintained and operated. William R. Latady is currently working on the problem of remodeling the ground floor of the stables to house a portion of the valuable exhibits donated by Dr. Thorington; the fund to cover the cost of this remodeling is also being raised by Dr. Thorington.

A Summer Camp, organized under the able chairmanship of Dr. Buchtel, was held in the San Juans of Colorado, and proved such a success that further A.A.C. Summer Camps seem assured.

The Third American Karakoram Expedition managed to establish eight climbers simultaneously in a well-stocked camp at 25,500 feet on K2, after packing all equipment and supplies on their own backs above Camp III, but they were then driven down under desperate conditions by a severe two-weeks' storm. Arthur K. Gilkey developed thrombo-phlebitis and was tragically lost by avalanche during the descent.

Preparations are rapidly being completed by our California members for an expedition to Makalu in 1954.

Upon the death of Richard L. Burdsall, his place on Council was filled for the balance of the year by our West-Coast member, David Harrah, who has also undertaken the compilation of a badly needed cumulative index for the *American Alpine Journal.*

The death of J. Henry Scattergood leaves the Club with but one surviving Original Member, Mrs. Robert E. Peary, Sr.

William S. Child, Editor-in-Chief of the *American Alpine Journal,* has organized an editorial staff to spread the tremendous load of work until recently borne by Robert H. Bates and David A. Robertson, and it is believed that the *Journal* will appear at increasingly earlier dates in the coming years. The 1953 issue completes a volume and a volume index will eventually be available.

The *A.A.C. News* has published six issues since the last Annual Meeting and, under the editorship of Lillian Gest, has become an important and eagerly-awaited Club publication.

Helen I. Buck is proceeding with the monumental task of very completely recataloguing the library and making cross-references, essential if a collection of its size and value is to be useful to members and others. She is being assisted in this work by Mrs. Hinds, a former librarian, who is also typing the cards to replace the handwritten ones.

During the year, under the editorship of Dr. Thorington and with the assistance of Henry Hall, the fifth edition of *A Climber's Guide to the Rocky Mountains of Canada* appeared, the stock of the previous edition being entirely exhausted. Also, under the editorship of Fred Beckey and, with the assistance of Joel Ellis Fisher, a supplement to the *Climber's Guide to the Cascade and Olympic Mountains of Washington* was issued to be bound with the remaining 1000 copies of the *Guide,* since the first 1000 have already been sold.

The Safety Report was again hailed as unique in its field, and Ben Ferris, Chairman of the Safety Committee, is engaged in enlarging and systematizing the sources of information on which it is based. There has been a widespread demand for this report outside the Club.

Many enterprising parties were in the field, several ascents of Mt. Robson were made, and Mt. McKinley and Mt. Cook were climbed. Members also climbed in the Tetons, Selkirks, Coast Range, Bugaboos, the Alps, Japan, and the Nun-Kun, where the French expedition led by Bernard Pierre made the first ascent of the Nun. Of course, the two Club-sponsored proj-

ects were the Third American Karakoram Expedition to K2 and the Summer Camp in the San Juans.

This report is largely statistical and omits much, yet its length is an indication of the activity of our members during the past year.

JOHN C. OBERLIN,
Secretary.

ANNUAL MEETING AND DINNER

Minutes of the 51st Annual Meeting of the American Alpine Club held at the Club House, 113 East 90th Street, New York, New York, on Saturday 5, December 1952, at 2:00 P.M.

President Gilman called the meeting to order. Some 40 members were present at the beginning of the business meeting and about 80 at the close.

It was

VOTED: To dispense with the reading of the Minutes of the last Annual Meeting, which had been published in the *American Alpine Journal,* and to accept them as thus published.

The Secretary next read his Annual Report which was thereupon accepted by *Vote.*

The Treasurer presented his printed annual Treasurer's report showing an operating loss of $2200.00, offset by donations of $3254.00. He then emphasized that much of the Club's funds were donated for specific purposes and are accordingly not available for meeting general operating expenses. After discussion it was

VOTED: To approve each item of expense during the past fiscal year as reported by the Treasurer in his Annual report.

VOTED: To approve the retention to date of the investments shown in the Treasurer's Annual Report.

The Librarian next presented her annual report, stating that it would be her last in this official capacity, but indicating that she proposes to assist Mrs. Hinds during the coming year, particularly with the cataloguing. It was

VOTED: To accept the report with thanks.

The President then announced that the Council had appointed Mrs. Hinds Assistant Librarian, the necessary funds for her salary to be raised by contributions. He emphasized the importance of completing the catalogue while Miss Buck is still available to assist.

Mr. Child, Editor-in-Chief of the *American Alpine Journal,* then spoke briefly concerning the reorganization of the Journal staff, with definite duties delegated to a number of Assistant Editors in an effort to systematize the work and ensure an earlier date of publication. He mentioned that articles were being received more promptly than formerly, greatly facilitating the work.

Mr. Bonney described the summer camp in Colorado and praised Dr. Buchtel's efficient management which made it an enjoyable experience for all concerned. While the necessary organization required much effort, the success of the outing should ensure that camps will be held by the Club in the future. Mr. Bonney moved a vote of thanks to Dr. Buchtel and his Committee, and being duly seconded, it was

VOTED: To express the Club's appreciation to Dr. Buchtel and his Committee for the hard work they had done to make the camp such an outstanding success.

The Editor of the *A.A.C. News,* Miss Gest, next reported that there had been six issues during the past year, with one due January 14, 1954. She attempts to bring out an issue several weeks after each Council meeting; the other two are then published about the first of March and the end of summer respectively. A great deal of interesting material is available which requires considerable condensation to keep the *News* to three or four pages. Miss Gest requested that all members send her items and stated that, if two advertisements can be obtained for each issue, they will pay for the mimeographing.

The Chairman of the Safety Committee, Dr. Ferris, then reported that there had been 19 accidents (11 fatal) so far in 1953, showing that the problem of mountaineering safety continues to be a serious one. Rappeling accidents seem to be on the increase and there have been 3 ski-mountaineering accidents. Some special problems arise from the use of nylon rope.

The Committee is at present compiling a bibliography on all aspects of mountaineering safety and will welcome suggestions. It was

VOTED: To accept the reports of Miss Gest and Messrs. Child and Ferris, with thanks.

Messages were next read from Dr. Hickson, Brigadier Sir Oliver Wheeler, M.C., and Sir Edwin Herbert. A number of distant members were in attendance, including Orrin Bonney and David Brower.

Mr. Fuller, Chairman of the Nominating Committee, read the names of those nominated to Council, these being David Harrah, to complete the term of Richard Burdsall, and H. Adams Carter, Dr. Charles S. Houston, and Walter A. Wood for the term 1954-1956. As no other nominations had been submitted, the Secretary acclaimed them as elected in accordance with By-Law 3C.

In the absence of Mr. Baldwin, Chairman of the Conservation Committee, that Committee's report was submitted by Mr. Goldthwaite.

Mr. Field, Chairman of the House Committee, invited attention to the elaborate exhibits installed by Dr. Thorington in the Club House. Changed several times a year, these add greatly to the interest of the various meetings and teas.

There being no further business, it was

VOTED: To adjourn.

The business meeting was followed by a series of informal illustrated talks, with a large audience, including guests, crowding the meeting room. William L. Putnam showed movies of H. M. C. Climbs in the Selkirks, accompanying them with an amusing commentary, and Arnold Wexler presented a series of beautiful Kodachrome slides taken in the British Columbia Coast Range. Mrs. Wilbert P. Frantz described the A.A.C. Summer Camp in a most enthusiastic and delightful manner, with slides which gave a very good idea of the camp and the surrounding peaks.

The Fifty-first Annual Dinner of the Club was held at the Harvard Club of New York City at 7:00 P.M., after a pleasant cocktail hour, and was attended by 227 members and guests.

President Gilman presided and promptly after dinner introduced the speaker of the evening, Dr. Charles S. Houston, who gave a thrilling illustrated talk, "The 1953 Attempt on K2." After the color movies which accompanied the lecture, a series of spectacular three-dimensional color stills were shown which left the audience breathless, and the meeting was adjourned at 11:30 P.M. with many members commenting that it had been one of the best Club programs they had ever enjoyed.

JOHN C. OBERLIN,
Secretary

REPORT OF THE LIBRARIAN

15 November 1952 to 5 December 1953

Since 1929, when I became your Librarian, the Library has grown from 524 to 5376 volumes. In the *A.A.C. News* we have tried to keep you posted on the current publications.

Our chief contributors of books have been Henry S. Hall, Jr., and Dr. Thorington, to whom we are also indebted for another large exhibit case and for securing from the Alpine Club an old relief of Mont Blanc.

The Lending Library now contains about 250 volumes. Many "classics" were added to this collection from the very fine gift of 89 books, donated by Paul Gabel of the Appalachian Mountain Club.

We are indebted to the following for other contributions of journals, photographs, maps, and miscellaneous material: C. Louise Avery, Evelyn Luquier, Mrs. Cowles, Dr. Gaebelein, Peter Schoening, Mrs. Orcutt, Dr. Thorington, and Joseph Wood, Jr.

From the sales of duplicate books and journals we realized $298.25. With this unexpected cash we were able to buy another table, a greatly needed filing case, library cards, and other supplies.

Much could be said about our Library, but the best way to appreciate its value is to use it. You will enjoy the fine catalog which Mrs. Hinds has been typing for us. Not only will you find there, author, shelf, and title cards but also cross references which include all kinds of interesting subjects besides mountains,

ranging, in alphabetical order, from the "abominable snowman" to "who's who among early women climbers."

This is my last report to you as Librarian of the Club. I want to express my thanks to members of the Library Committees and to others who, during these 24 years, have assisted in all kinds of work which had to be done here before the appointment of an Assistant-Secretary. In spite of the labor, we have had a tremendous amount of fun, which we regret that you could not all share with us.

Although I shall keep working temporarily for a while to help Mrs. Hinds in the completion of the recataloguing, I am looking forward eventually to seeing the world through my glamour glasses and enjoying adventures so thrilling that their tale will outclass the one in this last issue of *The Western Sportsman,* entitled "The Case of the Rambling Buck."

HELEN I. BUCK,
Librarian

REPORT OF THE COMMITTEE ON CONSERVATION

November 1953

A Conservation Committee was appointed, following the annual meeting in 1946, reviving an old activity of the Club. Committees on this subject have been continued since, under the able chairmanship of W. O. Field and W. P. House.

The present Committee has endeavored to carry on under the policy adopted at the March 1947 Council Meeting and at the annual meeting in Boston in 1947.

The Club has received numerous appeals to support conservation groups in opposing federal and state bills considered harmful and to advocate passage of bills to strengthen protection of wilderness areas. With few exceptions your Committee has not taken any action.

Matters that have received attention during the year include the Ostrander Amendment in New York regarding construction of dams in the Adirondacks, the Olympic National Park, the grazing bills before Congress and proposals to invade national parks.

In reviewing its role within the Club the Conservation Committee feels it should confine its activities to problems concerning mountainous areas only. These problems should be broad matters of national importance. Questions of a local nature can be more effectively handled by regional mountaineering clubs.

In general, the Club policy should be to oppose development of areas, both state and federal, that have been set aside as wilderness areas where such development would interfere with scenic beauty of mountains or the enjoyment of mountaineering.

The chief function of the Conservation Committee should be to keep the Club informed of movements affecting the conservation of mountain scenery and developments affecting the pursuit of mountaineering. Each member of the Committee should constitute himself a listening post in his territory. When emergencies arise which in the opinion of Committee members require Club action, a letter drafted by the Committee should be submitted to the President for him to sign and forward, with or without Council approval as he may decide.

Such action will probably be of rare occurrence and will be more effective if exercised at infrequent intervals.

RICHARD ARCHIBOLD
GEORGE E. GOLDTHWAITE
WELDON HEALD
RICHARD M. LEONARD
HENRY I. BALDWIN, *Chairman*

NONAME BASIN CAMP

North Thumb and Glacier Point behind it.

Photo, H. L. McClintock

In Memoriam

JOSEPH HENRY SCATTERGOOD
1877-1953

J. Henry Scattergood, a Founding Member of the Club, died June 15, 1953. He was born in Philadelphia and took degrees from both Haverford College and Harvard University. After graduation he began work with the American Pulley Company, moving shortly to the American Dyewood Company of which his father was President. In the course of his life he became a director of the Provident Mutual Life Insurance Company, the First National Bank of Philadelphia, the Lehigh Coal Company, and other companies and corporations.

A member of the Society of Friends, Mr. Scattergood was the first Chief of the Friends' Reconstruction Unit in France after the First World War and a member of the original Red Cross Commission to France. Under President Hoover he served as Assistant Commissioner of Indian Affairs. He was Treasurer of Haverford College from 1916 to 1949 and Treasurer of Bryn Mawr College from 1927 until a short time prior to his death. Mr. Scattergood was a trustee of the Hampton Institute and for a period served as President of the Trustees.

Mr. Scattergood's mountaineering began soon after his graduation from college. Each summer during the first three years of the century he visited the Canadian Rockies. He was the first climber to visit the Ice River Valley. Among his ascents were Mt. Mollison (first ascent), Mt. Stephen, Cathedral (attempt), Mt. Chancellor (attempt with C. E. Fay), Mt. Goodsir (S. Tower; attempt with C. E. Fay, reaching a point 150 feet from the summit), Mt. Vaux (first ascent and traverse), Mt. Chancellor (first ascent),

J. HENRY SCATTERGOOD,
a Founding Member of the Club.

Mt. Wapta (first ascent), Mt. Victoria (N. peak, first ascent), and later in the Selkirks he climbed Mt. Sir Donald, Eagle, and Avalanche.

Through the later years of his life his interest in mountaineering was undiminished. He attended meetings of the Club as often as possible, and he took a deep interest in the activities of its members. Though he was in poor health at the time of Maurice Herzog's visit to Haverford in 1952, he made a special effort to hear the story of the Annapurna climb and see the pictures. When the Haverford Mountaineers elected him an Honorary Member, he was greatly touched.

He was a man who gave generously of his time and effort for the betterment of his fellow men. His broad interests and abundant energy resulted in a life of accomplishment that was extraordinary. He had a sense of humor that was delightful. Through the years that I knew him he was always ready to talk about the mountains, and he used to refer again and again to the attempt on the South Tower of Goodsir.

Without doubt his mountain experiences and his mountain memories were a great resource and satisfaction to him all through the years.

Archibald MacIntosh

MAX E. FRIEDMANN

1890-1954

Max E. Friedmann, member of the American Alpine Club since 1942, died suddenly of a heart attack on a train approaching Chicago March 31, 1954. Mrs. Friedmann and he had been in the Virgin Islands for a winter holiday and were returning to Milwaukee.

Mr. Friedmann, who was 64, had been president of Ed. Schuster & Co., Inc. (which operates three large department stores in Milwaukee) since the death of his father in 1933. He had been very active in the community and his passing saddened his many business associates and friends. He is survived by his wife, Mrs. Elinore Friedmann, and two daughters, Mrs. James A. Wiebrecht of Cape May, New Jersey, and Mrs. George A. Ball of Port St. Joe, Florida.

Mr. Friedmann had long had a deep and active interest in all phases of mountaineering and as a young man had climbed in Europe in the Swiss and Tyrolean Alps. Among his guides was Edward Feuz (of the famous Feuz family of Swiss guides). He lost track of Edward for many years and was delighted when he "discovered" him in the Canadian Rockies some ten years ago, where he was employed as a guide in the Lake Louise area. Following that visit, Mr. Friedmann returned to the Canadian Rockies practically every summer, becoming increasingly fond of that beautiful country and adding to his roster of friends each year. Edward was his guide and companion on these outings. On several occasions Mr. Friedmann was accompanied by Mrs. Friedmann, and once by his two daughters. Even after Edward was retired he continued to act as Mr. Friedmann's guide. During the summer of 1953 Mr. Friedmann spent three weeks at Lake O'Hara with Edward.

He attended several of the Alpine Club's annual dinner meetings in New York and always looked forward to these meetings since he enjoyed the companionship of the fine group of men and women who comprise the Club's membership.

Raymond T. Zillmer

ARTHUR K. GILKEY

1926-1953

Art Gilkey, elected to the Club in 1950, and a member of the Third American Karakoram Expedition, died August 10, 1953. In critical condition from thrombo-phlebitis suffered at an altitude of 25,500 feet on K2, he was lost in an avalanche which occurred during a valorous attempt made by the climbing party to evacuate him to safety.

Born in Colorado September 25, 1926, Art grew up in Ames, Iowa, where his father is a professor, and received his Bachelor of Science degree at Iowa State College in 1949, following a tour of duty with the Navy during World War II. Entering Columbia University, he was granted the M.S. degree for a thesis on structural geology done on the Juneau Ice Field during the summer of 1950. Prior to his death, Art had completed requirements for

his doctorate, having compiled an excellent thesis entitled "Fracture Pattern of the Zuni Uplift." His Ph.D. degree has been awarded posthumously.

Keenly interested in mountaineering, Art acquired valuable experience and technique as a guide for three seasons in the Petzoldt-Exum School of Mountaineering in Grand Teton National Park. In the summer of 1950 he joined the Juneau Ice Field Research Project and in 1952 was leader of its field party. A strong and capable climber, he rapidly proved himself a most valuable asset to expeditionary mountaineering.

Professionally, Art was a brilliant scholar and an excellent geologist. As a companion in the field, he measured up to the highest standards and demonstrated on all occasions his willingness to carry more than his share in any organized climbing or scientific effort.

His death was a severe blow to those who knew him. His strength of character, objectivity of purpose, and pleasant personality won him the affection and admiration of all those who worked or climbed in his company. His loss to the geology profession cannot be overestimated. His competence and field ability had marked him as a man with a great professional future.

To say that Art will be missed is entirely inadequate. In pursuit of his scientific and mountaineering objectives he lived up to the highest traditions of scientific research and expeditionary mountaineering.

Robert B. Forbes

Before the Third American Karakoram Expedition, I knew Arthur K. Gilkey as a lean athlete with springy step, quick, humorous eyes, and an enchanting smile full of health, good nature, and love of life. During the preparations for the expedition and the expedition itself, his companions were to know him better: for his thoughtfulness and self-effacing qualities, for his intellectual curiosity, for his courage, determination, and pleasure in new adventures. Art had great vitality and an attractive personality. His eyes would sparkle as he spoke of a new summit he had just seen or of some theory he was working on about the ice ships on the Baltoro Glacier. On K2 he was always doing

things for others, as when he descended 3000 feet from Camp V to Camp II to get mail, when it was my turn.

Art shared much of the reconnaissance on the Abruzzi Ridge of K2 last summer, especially between Camps II and III, and VII and VIII. His feat with Peter Schoening of cutting steps up the steep ice below Camp VIII, a route never made before, was an admirable piece of mountaineering. Had he lived and the weather permitted, he would almost surely have been a member of a summit team. His being suddenly stricken with thrombophlebitis at 25,500 feet on K2 seemed impossible. He had been in excellent physical condition throughout his stay in the Karakoram. Such an illness appears never to have occurred on any mountain or arctic expedition before, and it is very rare in such a young man. All one can say is that Art apparently had some physical defect which was aggravated by conditions on the mountain. Thrombo-phlebitis might have crippled him later and the results been just as tragic.

Art Gilkey was carried away by an avalanche while he was being evacuated from Camp VIII at 25,500 feet on K2 during a terrible monsoon storm. His illness had advanced to the point when his only chance of survival (a slim one) depended on our getting him to a lower altitude. His seven companions took desperate risks to try to get him down, and it was chance alone that they were not all beside him at the moment the avalanche carried him to his death.

The memorial cairn erected to Art by the expedition at the confluence of the Godwin-Austen and Savoia Glaciers looks over some of the world's most magnificent country. It will long tell travelers to the world's second highest mountain that a loved and admired geologist from Iowa died in the Karakoram. Hunza porters, Navy companions, professors, janitors, distinguished scientists, and mountaineers—all who knew him—join in mourning the death of one of the most lovable and promising young geologists of our times. His friends will be glad to know that Art Gilkey's name has been proposed for a handsome glacier which Art explored as leader of the Juneau Ice Field Research Project. A collection of books in his name has been set up in the Geology Department at Columbia University, and it is hoped

that a hut in his name will be built in Grand Teton National Park. Those of us who knew him will never forget him.

Robert H. Bates

HENRY STURGIS GREW
1874-1953

Harry Grew, as he was known to his friends, had been a member of the Club since 1935. Almost his only climbs were made in three years during his late fifties, a fact of which he was rather proud, as few men begin climbing at such an age. He was a good friend of the late Allston Burr, and these two were sometimes seen in company with James B. Conant on White Mountain trails in recent years.

For twenty years he was president of the National Union Bank in Boston until its merger with the State Street Trust Co., of which he became a director and chairman of the executive committee. He had been chairman of the board of West Point Manufacturing Co., president of the Massachusetts Memorial Hospitals, and vice-president of the New England Conservatory of Music. His wife and four children survive, as do also two brothers, one of whom is Joseph C. Grew, the diplomat and former ambassador to Japan.

Mr. Grew derived considerable satisfaction from his membership in the Club. The mountains, he said, gave him something in relaxation and contentment which he had not found to the same degree elsewhere.

H. S. Hall, Jr.

MERL LAVOY
1886-1953

It was in the spring of 1910 that Herschel Parker and I first met Merl LaVoy. We were in Seattle completing the final arrangements for our 1910 Mt. McKinley trip when he volunteered to join us as expedition photographer. One look at him was sufficient to confirm his physical fitness, and in a few picturesque

sentences he outlined a background of frontier experiences that justified us in adding him to our party.

His contribution to the efforts of the 1910 expedition were so outstanding that we gladly welcomed him to our 1912 party which, starting from Seward on the Kenai Peninsula with dog teams and snowshoes, ended at Fort Gibbon in the Yukon seven months later.

It is strange that after having spent the better part of two years with Merl in uninhabited country, I know so little of his childhood. The report of his death, written from Johannesburg, South Africa, states that he was a native of Wisconsin, but if so, he moved while still a young boy to Oregon. Both of his parents died while he was young and he went to Oregon to live with an uncle whose home was a log cabin in a heavily forested area. His schooling was erratic and of short duration. He often said that his education was acquired by reading newspapers that usually reached his uncle's cabin many weeks late and over devious trails and by uncertain carriers.

Compared to the other members of our expeditions, Merl was almost as much a product of the forest as was Kipling's Mowgli, but once out of his rustic environment he became adjusted to the ways of civilization with startling rapidity.

His ability as a photographer was likewise a developing influence and brought him in contact with new types of minds and business interests. When he came to us in 1910, he had a camera and used it with skill, so much so, in fact, that he soon began marketing his Alaskan photographs to newspapers and magazines. In 1911 he bought a Graflex which became his most highly-prized possession. While stalking a herd of caribou with this camera, he suffered the only physical injury of his years of travel in the Alaskan wilderness. As he focussed his shot, he stepped backward off a steep ledge and cut his knee to the bone. Within a few days following the accident we began our final attempt on the summit of Mt. McKinley, and despite the seriousness of his injury he carried out his arduous duties with complete selflessness.

The courage and energy which he exhibited in the wilderness carried him far in his chosen profession. As a representative of

Pathé Frères he girdled the earth twice and it is stated that he exposed more feet of film in World War I than any other photographer.

As a friend and companion he combined the best qualities of his frontier upbringing—loyalty, strength, courage, and a consuming love of adventure.

Belmore Browne

Book Reviews

The Conquest of Everest, by Sir John Hunt, with a chapter on the final assault by Sir Edmund Hillary, and foreword by H. R. H. the Duke of Edinburgh. XX + 300 pages, 79 photos, including 8 in color, 28 sketches, and 4 sketch maps. New York: E. P. Dutton & Company, Inc., 1954. Price, $6.00. English edition: *The Ascent of Everest,* by John Hunt. XX + 300 pages, 79 photographs, including 8 in color, 28 sketches, and 4 sketch maps. London: Hodder & Stoughton, 1953. Price 25/—.*

To attain the highest peak in the world after seven previous expeditions had tried and failed, is a proud achievement, and this book is an appropriate account of it.

In his first chapter Hunt says:

> The mission we undertook was not, in our eyes, in the nature of some competition on a giant scale in which we vied to outdo the efforts of previous expeditions, dramatic and popular as such a concept might be. Indeed, prolonged attempts to climb a difficult mountain are, or should be, essentially different from those of a competitive sport. A possible analogy, however, might be that of a relay race, in which each member of a team of runners hands the baton to the next at the end of his allotted span, until the race is finally run. The Swiss in 1952 received that baton of knowledge from the latest in the long chain of British climbers and they, in turn, after running a brilliant lap, passed it on to us. We chanced to be the last runners in this particular race, but we might well have not succeeded in finishing, in which case we would have handed on our knowledge to our French comrades who were preparing to take up the challenge.
>
> (p. 6)

These are sentiments that will appeal strongly to American climbers.

The book describes the elaborate and careful preparation of the expedition, the long and well planned approach to the mountain, the painstaking procedure for acclimatization, the difficult transportation of stores to the higher camps, and the final suc-

*The Club is fortunate in the acquisition of copy No. 7 of the special edition of *The Ascent of Everest,* of which 20 copies were published and autographed by Sir John Hunt and Sir Edmund Hillary.

cessful assault. The expedition was well planned and well executed, and the party worked harmoniously throughout, which is a tribute to the skill of the leader. They had some bad and some good luck, but were fortunate in having good luck in weather when they really needed it.

There is a thrilling description of the passage of the Ice Fall, which on close acquaintance proved fully as harrowing as it seemed to us from the bottom.

The expedition relied heavily on oxygen, using two types of apparatus, both open and closed circuits, beginning its use at comparatively low altitudes and using it both for sleeping and climbing on the higher slopes. The difficulties of leakage, breakage, and freezing are fully stated, and it is recognized that, if climbers so dependent on oxygen should be deprived of it at high altitudes through accident or storm, they would be in very great danger. Failure of oxygen equipment appears to have been partly or wholly responsible for the inability of the first assault party, Bourdillon and Evans, to reach the final summit. The book therefore still leaves open the question whether the advantages of oxygen outweigh its dangers and disadvantages.

The appendices contain much useful information about equipment, food, and supplies.

Oscar R. Houston

The Story of Everest, by W. H. Murray. 195 pages, 24 photographs, 14 maps and diagrams. English edition: London, J. M. Dent & Sons, 1953. Price, 15/—. American edition: New York, Dutton, 1954. Price, $3.75.

Murray's book is opportune, not only because of Hunt's later record which concludes the Everest saga, but because a summary of the former expeditions has been needed now that the earlier volumes are difficult to obtain. Neither Younghusband's nor Ullman's summaries are satisfactory.

Murray is an experienced writer and has produced a clear, well-balanced book. Over half of it is occupied by the first three expeditions—1921, 1922, and 1924—which is just, for the expeditions of the 1930's added little that was fundamental to what had been learned on the earlier attempts. In 1936 and 1938 the weather precluded any hope of success.

The author has not just compiled an anthology; he has reinterpreted the stories in the light of later evidence. He shows (p. 111) how the lessons from 1922 and 1924 were appreciated in 1933; and, equally (p. 181), how the Swiss failed to appreciate them fully in 1952. It may be hoped that the success of 1953 will rub home once more the need for acclimatization that the hazardous victory of the French on Annapurna has tended to obscure. Had the Swiss not underestimated this and other factors in 1952, Everest would very possibly have fallen to them.

Some of Murray's views are controversial; he seems to incline toward the post-monsoon period as being the best for climbing Everest; he is dubious about the need of oxygen. He is unlikely to have many supporters of the first opinion but, in view of the experiences of Houston's party on K2 in 1953, he may have powerful backing in his dislike of oxygen. Still, those last 800 to 1000 feet on Everest may make all the difference . . .

It may be noted that Murray (p. 104) holds that Odell saw Mallory and Irvine at the first and not the second step; and he agrees (p. 120) with the view put forward by Smythe that the ice-axe found by Wager and Wyn Harris marked the site of a slip. He suggests that this was probably on the ascent, not the descent. In this case they would (see the line drawing on p. 126) have fallen before they ever reached the first step and the question of whether Odell really saw them at all is in doubt.

S. B. T.

The Mountain World, edited by Marcel Kurz for the Swiss Foundation for Alpine Research, Zurich. 220 pages, 64 illustrations, folding panorama, maps, and sketches. New York: Harper & Brothers, 1953. Price, $6.00.

This is an important book, attractively published. It is the eighth of a series prepared by the Swiss Foundation for Alpine Research, but the first edition in English. This and the previous seven editions were published in either French or German, or both, under the titles: *Berge der Welt* or *Montagnes du Monde.*

For many years people wondered why so relatively little had been heard from the Swiss in the Himalayas or the other great mountain ranges of the world outside of their own Alps. Be that as it may, they have now appeared in many lands as contenders

for top honors in the field of exploratory and high-altitude mountaineering.

This book deals largely but not exclusively with Swiss expeditions. There is an opening chapter on the late Gustav Hasler by Othmar Gurtner. Then a chapter by Marcel Kurz, "A Century of History," covers the attempts to approach Mt. Everest and find the best route up the mountain; the author comments freely, expressing some rather bold opinions. A short chapter by Elizabeth Cowles, "North to Everest," records that, in the fall of 1950, an American party organized by Oscar R. Houston, including Charles S. Houston, Anderson Bakewell, H. W. Tilman and Mrs. Cowles, was the first to approach Everest from the south. Charles Houston and Tilman actually reached 19,000 feet on Pumori, only six miles from the summit of Everest.

More than half the book is devoted to the first Swiss attempt on the great mountain in the spring of 1952. The Swiss party was the first to force a way up the Khumbu glacier above the great icefall, up the Lhotse face to the South Col and almost to the South Peak itself, reaching an altitude of about 28,250 feet. There are also chapters on "A Journey to Gosainkind (Nepal)" by Ella Maillart, "Our Climbs in Boliva" by Hans Ertz, "The South Peruvian Andes" by Piero Ghiglione, "Mountain Exploration in Northeast Greenland" by six authors, and on the geology and plants of the Everest region.

As often with books of joint authorship, there is considerable variety of style, but this does not obscure the substantive interest. The writing could perhaps be called more literal than literary, but the end result is good. The illustrations are well chosen and beautifully reproduced. Pocketed in one cover is an interesting folding panorama of the entire length of the Khumbu valley and upper basin. The various sketch maps are adequate. There is no index, a curious omission in such a book.

This is one of the most important current mountaineering works in English. With the succeeding volumes, if published, it will find a place in the mountaineering libraries of most collectors aspiring to completeness. Much of the material will not be found elsewhere in English.

Henry S. Hall, Jr.

Everest 1952, by André Roch. 72 pages of black and white and 8 of color photographs with commentary. Preface by Lt. General E. F. Norton, 9-page introduction by Dr. Edward Wyss-Dunant, map, and end papers. Geneva: Editions Jeheber, 1952.

The members of the magnificent Swiss expedition to Mt. Everest in the spring of 1952 should be proud of this handsome book of pictures which tells their story. The quality of the photographs is high and the book documents the human side of the expedition particularly well. Throughout, it gives the impression of close friendships and teamwork of the highest order. Dr. Wyss-Dunant's introduction gives a clear account of the history of Mt. Everest and comments modestly on some of the accomplishments and discoveries of the Swiss. Though more text would be welcome, this is an important book, for the splendid contribution of the Genevan expedition to the British success in 1953 should not be forgotten. As on other mountains and in life, we climb upon the shoulders of the past.

Robert H. Bates

Everest, by La Fondation Suisse pour Explorations Alpines. 198 pages, including 136 pages of black and white photographs, 8 of color photographs, and 16 pages of introduction by Othmar Gurtner. Geneva: Jeheber, 1953.

This picture book of the Swiss expedition to Mt. Everest in the fall of 1952 is a superb example of the photo-engraver's art. The quality of reproduction of the black and white illustrations is so extraordinary that artistically this clothbound volume far surpasses *Everest 1952.* Some of the best pictures of the earlier book appear here along with many new ones, especially those of André Roch and N. G. Dyhrenfurth. The close-ups at the end are outstanding, while Herr Gurtner's introduction is interesting for its analyses of closed-circuit and open-circuit oxygen apparatus. Telling a story primarily through pictures and captions, however, has limitations. One does not get the "feel" of the full expedition. Some things cannot be photographed and the true flavor of an enterprise may be lost if one presents it through illustrations alone. *Everest* lacks some of the warmth of *Everest 1952,* but for polished, artistic presentation it ranks among the most beautiful books of mountain pictures.

R. H. B.

Avant-Premières à l'Everest, by Gabriel Chevalley, René Dittert, and Raymond Lambert. Introduction by Dr. Ed. Wyss-Dunant. 304 pages, 36 illustrations, sketch maps, and appendices. Paris and Grenoble:Arthaud, 1953. Price, $3.50.

This fine account of the great effort of the Swiss to be the first on Mt. Everest brings us the spirit and atmosphere of the ultimate in mountaineering, right from those in whose homeland alpinism came into being. We meet and fall in love with a band of sworn friends who admit that they have long been ravaged by the "alpine virus" and have from childhood made climbing a way of life. When unexpectedly strong backing appears, they set forth for a bold bid for the greatest prize that the mountain ranges of the world have to offer. The consciousness of their being pioneers, with all its drawbacks and its thrills, never leaves them. The splendid progress that they make probably surprises even them. The day comes when the two outstanding men, Raymond Lambert and the Sherpa, Tensing Norkey, make a bid for the summit. But altitude and a poor turn in the weather, chiefly the former, forces their withdrawal before they are overcome by the sort of low-oxygen euphoria which they think may well have affected Mallory on his final climb.

In the fall, before their authorization from the Nepalese government runs out and reverts to the tensely waiting British, they return to the fray. This time they have a heavier and more completely equipped expedition, fortified by fresh blood from the ranks of the most brilliant climbers of Switzerland. And still with them is the brilliant Lambert-Tensing team. Their intention is to take advantage of the clear autumn days and, indeed, they do push forward with splendid speed and with every hope of making a good showing. In the shortening days of November, however, as they approach the heights reached in the spring, inexorable winter closes in and simply freezes the brave expedition to a halt.

More than once credit is given to their predecessors on the southern approach—to Houston in 1950 and to Shipton in 1951—on whose shoulders they are the first to admit they stood. And they swell with justifiable pride at the generous greeting from

Nepal the following spring when Colonel Hunt telegraphed them "half the glory" of the great British success.

Roger S. Whitney

Nanga Parbat, by Ulrich Ling. 52 pages, 24 photographs, 3 maps, and 1 sketch. Munich: Bergverlag Rudolph Rother, 1953. Price, DM. 3.80.

This inexpensive, small paperbound volume was brought out in early August, just a month after the actual ascent of Nanga Parbat was made and at the very moment when the controversy between the members of the expedition was breaking into the press. It gives a summary of all the previous expeditions and devotes the last eleven pages to the successful climb. The summaries are good although somewhat dramatized for the average reader and not as detailed as those found in Dyrenfurth's "Zum Dritten Pol." The final fifth of the book, however, is of more interest since here is found new and somewhat controversial matter. The account suggests that there was no disharmony among the members of the expedition. The disputed permission to climb is reported as readily given by Aschenbrenner, who is said to have urged the climber in best shape to go on alone. There is no mention of the separate starts for the summit; it is merely stated that Buhl climbed faster. Most of the photographs are well reproduced, and although many have appeared already in other books and there are none from this year's expedition, they nevertheless add greatly to this small book.

H. Adams Carter

Zum Dritten Pol, Die Achttausender der Erde, by Günther Oskar Dyrenfurth, with contributions by Erwin Schneider. 286 pages, 47 photographs, 2 drawings, 2 geological profiles, and 8 maps. Munich: Nymphenburger Verlagshandlung, 1952.

In a year in which two of the fourteen mountains over 8000 meters in elevation, Everest and Nanga Parbat, have been climbed, and three others, K2, Manaslu and Dhaulagiri, attempted, a book dealing with these very peaks cannot fail to arouse our interest. Dr. Dyrenfurth has for the first time systematically described all the "eight-thousanders" (mountains

higher than 8000 meters or about 26,000 feet) and the attempts made through 1951 to climb them. The author begins with a discussion of the possibility of other higher peaks and tells how both Minya Konka and Amnyi Machin were for some time suggested as being higher than Mt. Everest. The bulk of the book is devoted, however, to the real eight-thousanders, of which Everest, K2, Kangchenjunga, Annapurna, and Nanga Parbat naturally receive the greatest attention.

The description of each mountain is divided in turn into the five following sections: the name or names by which it has been, or now is, known, its altitude, exploration and attempted ascents (the actual ascent in the case of Annapurna), estimates of possible routes of ascent, and the geology of the region. In the case of Mt. Everest all available data on the "abominable snowmen" are given as well. Also included are three excellent tables which give the name, altitude, altitude reached by climbers, latitude and longitude, region, and remarks on all the eight-thousanders, the seven-thousanders (roughly mountains over 23,000 feet in altitude), and the unsuccessfully attempted seven-thousanders. Dr. Dyrenfurth states that the bibliography is not intended to be complete. The only obvious omission of an important work on the eight-thousanders that I noted was Miss Elizabeth Knowlton's *Naked Mountain.*

Dr. Dyrenfurth has for many years been a careful student of Himalayan affairs. He himself led two expeditions to what he calls the "Third Pole," in 1930 to Kangchenjunga and in 1934 to the Karakoram. He has obviously done an enormous amount of further research which is reflected in this volume. There are few places in which we can quarrel with the facts. However, Paul Petzoldt may be surprised to find himself a German-American. Also, the second ascent of Nanda Devi cannot be definitely confirmed since the ill-fated members of the expedition were not seen after they disappeared above their high camp, heading toward the summit. Moreover, there are details about the 1939 American expedition to K2 which some informed people will deny as factual. To be sure, very little has been published about this climb, and the available information is often confusing, if not contradictory. The author has not presented both sides of

the question. In general, however, the material is accurately and well presented. In addition to stating fact, Dr. Dyrenfurth does not hesitate to pass judgment on the course of action taken by the various expeditions. Although the author speaks with authority, readers will not always agree with him. For instance, he criticizes the Americans on K2 in 1938 for wasting time on a reconnaissance which had already been completely carried out by the Duke of the Abruzzi. Careful examination of the material published by the Duke's expedition shows that they recommended no route and declared the mountain unclimbable. Though high in his praise of the personnel and organization of the 1938 expedition, he feels that they did not take enough risk with the weather in not pressing on further with the limited supplies they had available. His opinions regarding the nearly fatal Annapurna expedition are of the greatest interest. The climbers did not seem mentally alert and the author attributes their many irrational acts to the Maxiton pills which they took to ward off the effects of fatigue. He rightly criticizes the use of these highly dangerous drugs. I was surprised that he was not critical of the violent massage given the climbers' frostbitten hands and feet, a practice now long condemned.

Here is certainly the most complete, brief record of what is known about the world's highest mountains. Excellently presented, systematic, and useful for reference, it is at the same time highly readable and interesting to the casual reader and the mountain specialist alike. It is well printed also. The many excellent photographs are beautifully reproduced. In short, the book is well worth reading and owning.

H. A. C.

Seven Years in Tibet, by Heinrich Harrer, translated from the German by Richard Graves. Introduction by Peter Fleming. 288 pages, 1 colored frontispiece, and 25 black and white illustrations. London: Rupert Hart-Davis, 1953. Price 16/—. New York: E. P. Dutton & Co., Inc., 1954, 314 pages, 46 photographs, and 2 maps. Price, $5.00.

The author was a member of the 1939 German reconnaissance expedition to Nanga Parbat. On the way home he was picked up

by the British and interned in a prisoner-of-war camp at the foot of the mountains in northwestern India. Escaping in May 1943, he was recaptured and brought back to the prison camp, where he escaped again in April 1944 and ultimately made his way with one German companion to Lhasa where he lived for five years until the Chinese invaded Tibet. This book is an account of how, by a combination of diplomacy, personal charm, guile, bluff and daring escapes over the passes, the author and his companion arrived in Lhasa after 21 months of effort. The book then details their life there for the next five years, where they worked as translators, engineers, sports instructors, etc., and the author became a personal friend of the Dalai Lama.

In his preface the author says, "As I have no experience as an author I shall content myself with the unadorned facts." And this is precisely what he has done. The result is a simple, charming narrative, with no heroics, no metaphysics, no scorn of primitive conditions but a full recognition of the attractive and unattractive parts of Tibetan life. There are accounts of the great New Year's Festival in Lhasa, of other celebrations, of daily life among monks, nobles, and commoners, of habits, dress, and the common occurrences of life. The book seems to me to give a better picture of life in Tibet than any other I know.

In reading books like this and *No Picnic on Mount Kenya* by Felice Benuzzi, one cannot help being struck with the incredible things that men can accomplish in pursuit of Liberty.

O. R. H.

The Ultimate Mountains, by Thomas Weir. 98 pages, 76 photographs, and 4 sketch maps. London: Cassell & Co., Ltd., 1953.

Thomas Weir was a member of the Scottish Mountaineering Expedition to Garhwal in 1950 and this brief book is his record of it. Rather like a diary at times, the book is at its best in describing actual climbing. The photographs, some by Douglas Scott, well serve their purpose of illustrating the story. It is certainly a book which should be in the possession of anyone planning or hoping to go to Garhwal, but would prove considerably more useful if it contained a more complete map and an index, and were somewhat longer.

John C. Oberlin

La Conquête du Salcantay, Géant des Andes, by Bernard Pierre. 193 pages, 15 illustrations, 3 maps, bibliographies. Glossary of Quechua and Spanish expressions by Prof. Theodoro Meneses. Paris: Amiot-Dumont, 1953.

This book is an unqualified "must" for anyone interested in Peruvian mountaineering. The early half recounts the first ascent of Salcantay, northwest of Cuzco. The latter half discusses the problems of *Andinisme,* which is neither *Alpinisme* nor yet *Himalayisme.*

This latter section merits translation and separate publication. There are sections on the geography, exploration, weather, and approaches to the Cordillera de Vilcabamba. There is also a survey of all the other ranges in Peru considered as mountaineering frontiers. A bibliography is given for each range. There are sections on various aspects of mountaineering expedition problems in Peru; there are notes on the future of Indians as porters and on the use of the ice-axe to kill cows. Regrettably, the author feels constrained to offer no more medical advice than "take a doctor." The glossary, by a professor of Quechua at the University of Lima, correlates several hundred Quechua expressions with their French and Spanish equivalents.

The first half of the volume, concerning Salcantay, is good reading. Pierre has written other books, and he has an enthusiastic style with change-of-pace. He is clever at characterization and generous toward his American expedition-mates. He utilizes the Marx-Broennimann incident to good literary advantage. The "competition" of the "rival" parties provides suspense, and the characterization of Marx and Broennimann is interesting in terms of wider issues. The photographic coverage, especially of the route and the summit climb, is excellent.

David Harrah

Nelle Ande del Sud Perú, by Piero Ghiglione. 169 pages, 78 photographs, appendices, and folding map. Milano: Garzanti, 1953. Price, L. 1200.

Despite his advanced years, Piero Ghiglione's abundant energy and enthusiasm are apparent throughout this new book which describes his expeditions and climbs in the Andes of southern

Peru in 1950 and 1952. Ranges little known, poorly mapped, and difficult of access are penetrated afoot and on ponyback. The author's interests include the flora and fauna, geology, and folklore of the regions visited, as well as the mountaineering possibilities. The descriptions of his climbs on Ausangate, Solimana, Corupuna, and Salcantay and of his explorations in the ranges of Cayangate and Yucai and the Veronica massif are, however, somewhat confusing to a reader not already familiar with such regions. There is no index, but only a table of contents and list of illustrations. Some of the photographs are excellent. An account of the 1952 expedition, carried out in the company of the Austrian alpinist Mathias Rebitsch, the Swedish climber Anders Bolinder, the Peruvian geologist Alberto Parodi, and Felix Marx is included in *The Mountain World, 1953*. Ing. Ghiglione's enterprise has helped to draw attention to a fascinating portion of the great Andean chain where much still remains to be accomplished. M. G. O. and J. C. O.

The Antarctic Today: A Mid-Century Survey by the New Zealand Antarctic Society, edited by Frank A. Simpson. 389 pages, 45 illustrations, diagrams, a folding map and index. Wellington: A. H. and A. W. Reed, in conjunction with the New Zealand Antarctic Society, 1952. Price, 47/6.

Here is a book about polar exploration that, with the exception of a couple of chapters at the end, is as cold and impersonal as the great antarctic continent itself. *The Antarctic Today* consists mainly of a series of thumbnail sketches—some large thumbs, however—of the history of the Antarctic and the development of Antarctica's commercialability, which so far has been confined to the bloody but lucrative slaughtering of seals and whales. Many of the chapters were written by New Zealanders and reflect somewhat the fastidiousness one senses in that country as well as in its people. Southern New Zealand lies on the fringe of the cold antarctic waters from which substantial wealth has come, but its northern end is definitely sub-tropical. The conditions in New Zealand are exemplified by the foreword which states, "New Zealand has a strong tradition of interest in Antarctica, but inevitably our agricultural economy and preoccupation with urban development have caused anything out-

side the three-mile limit seaward to be regarded as at best a luxury and at worst a nuisance . . . If Government action or lack of it is a reflection of the general attitude of the people it is clear that too many New Zealanders have been unaware of what is going on in the Antarctic and why." *The Antarctic Today* might be a remedy.

In 1923 the British claims in Antarctica were divided into the Australian Antarctic Territory, which takes in about 115° of longitude, from 45° to 160° E. with the exception of a sliver, Adelie Land, ceded to the French; the Falkland Islands Dependencies; and New Zealand's Ross Dependency. In all, this is about 225° of peripheral longitude of Antarctica and, although this great area has since 1923 been "administered" by the countries mentioned, no sacred British sovereignty is acknowledged by other countries of the world and, according to the policy maintained by the United States, Antarctica is politically, as well as physically, still without a master.

In the first paragraph of Chapter One, "Introducing the Antarctic," the size and length of the coastline of the continent are given, then come statements as speculative as many others found in the chapters on glaciers and glacialogy, geology, and sea and air navigation. It is stated, "The greatest elevation of the surface of the Ice Cap occurs close to the South Pole . . ." but as yet less than half of the continental area has been seen by man and, for all we know, super alpine ranges may be found in the area enclosed by longitudes 1° to 150° E., and south of Latitude 72°, and in distances ranging north and south from 700 to 1400 miles.

It is also stated, "In winter the surface of the Southern Ocean freezes and a belt of pack ice up to 30 feet thick and from 100 to 1000 miles wide surrounds the continent from April to December." In fact, while some fragmentary efforts to skirt the edge of the ice pack in winter have been made, there has been no overall observation of the pack ice during the winter season, and as for pack ice up to 30 feet thick, it might as well be said that window panes on edge and three feet long constitute a mass of glass three feet thick.

At the beginning of Chapter Two, the author has chosen to quote the following lines from Milton:

> Beyond this flood a frozen continent
> Lies dark and wilde, beat with perpetual storms, etc.

Delighted as I am with poetic expression, the fact is that a frozen continent "deep in snow and ice" glitters in the sunlight, sometimes 24 hours a day and for days on end, and even the moonbeams and auroral light reflected from the snow and ice inhibit, relatively, such Stygian darkness as is found in the jungle areas of the tropics. If we hope to bring the vast area of Antarctica into the province of man's economic potential, it is time that we turned to facets other than those presented solely by the histrionic adventures in early polar exploration.

Notwithstanding the above, the chapters "Antarctic Glaciers and Glaciology" and "the Geology of the Antarctic" contain a wealth of information and some well-educated guesses, sufficient indeed to stimulate the desires of all those to whom tumbling glaciers, beacon sandstone, and towering *horsts* are hallowed.

In Chapter Two the snowy surface and its isostacy are described and the huge continental glaciers and great glacier arms which debouch from it, as well as large floating ice tongues. Although the greatest ice mass in the world today is about eight times more extensive than that of Greenland, we are left in considerable doubt as to the thickness of the ice cover. There is some evidence that in places it was more than 1000 feet thicker than it is today. Movement of the ice mass is obvious, in some spots at the rate of 100 feet per annum, in others at greater speed.

An interesting phenomenon mentioned is the apparent quite recent emergence, geologically speaking, of certain mountains from the continental ice sheet, with apparent amelioration of climate to allow the formation of lakes. The question as to whether the ice sheet will wax or wane in the future is of great importance to the world, but it seems unlikely that the waning will be so rapid and independent of the atmospheric content as to raise the oceans 50 feet and involve the submergence of all wharves, docks, and warehouses throughout the world.

Actual study of the geology of the Antarctic, an area estimated at between 5,000,000 and 5,058,356 square miles, is as yet hardly begun; even half of the 14,000 mile coastline has not yet been

in any way explored. Furthermore, while there is only a very small fraction of the surface of Antarctica free of snow and ice, much of that surface is almost vertical and exposed because it is too steep for even the softest falling snow to cuddle. References to mineral deposits are considerable, mainly in respect to coal, but eminent geologists theorize that parts of the Antarctic may carry appreciable amounts of uranium, monazite, gold, iron, and manganese, as well as petroleum. Reading of the chapter "Geology of the Antarctic" might well direct future prospectors to the proper locale for a claim and at least brings one to a realization that Antarctica is no mysterious cold bed, but a normal continent whose past history is closely comparable to that of other continents.

In the chapter "The Seas Between," the author delineates a division of interest. He says, "A physicist, looking for explanations of the temperature and physical property of the sea water in deep ocean basins, for instance, may be influenced by such considerations in contouring a ridge either as disconnected parts separated by channels, or as a continuous barrier. A biologist, on the other hand, thinks of submarine ridges as avenues of dispersal for animals. A geologist looks for continuation in submerged portions of the earth's crust of structures which he has studied on land and contours accordingly." Also in that chapter and the one on marine biology, mention is made of a great many interesting things such as foraminifera, the spectacular flush of phytoplankton, the abundant diatomaceous and globigerina ooze, the negligible quantity of dinoflagella, and glauconitic and radiolarian sediments, but there is nothing in these chapters that will stir memories of pitons and crampons.

The chapters, "Whales and Whaling in the Southern Ocean" and "Seals of the South Ocean," contain some revealing paragraphs such as ". . . additional protection against loss of heat is provided by (the whale's) bulk." This is a matter probably well known to whales since, it is stated, young blue whales put on weight at the rate of 200 pounds a day and finally, when fully grown, equal the bulk of 2560 men. And, "Sperm whales are polygamous; they spit, or rather spout sideways and have tremendous powers of endurance, sometimes diving to a depth of

3000 feet and staying down for as long as 45 minutes. One wonders if that might be the only means of escape from the family squabbles. The non-polygamous whales, as a rule, stay down for only a very few minutes." The growth of whales, however, is nothing to that of seals. A baby Weddell Seal, weighing 60 pounds at birth, doubles its weight in a fortnight, all this by drinking milk and eating shrimps, products evidently not to be included in a weight-reducing diet.

The description of Antarctic birds is fascinating, notwithstanding the author's reluctance to "anthropomorphicize" his descriptions. Yet he, too, nostalgically recounts, ". . . the indescribable beauty of a Snow Petrel winging silently along a maze of leads in pack ice—and the recurring routine of the penguin nesting season with all its evidence of vigorous life adapted to survival in a land where man has yet only experimental tenure."

"Sea and Air Navigation" evidently is written from a sea-dog's point of view and, although the author states correctly that the exposed portion of icebergs varies considerably, his estimate that "there is generally about six to eight times as much below the surface as above" is not corroborated by estimates made by others referred to in other parts of the book or by his own reference on a later page.

In the discussion of the use of aircraft in the antarctic, together with reference to several epic long-distance flights such as that made by Hollick-Kenyon, piloting and navigating for Lincoln Ellsworth, and Finn Ronne, navigating along the coast of the Weddell Sea, there are these statements, "there can be no doubt that the main use of aircraft in the Antarctic is for short-distance reconnaissances from a ship or a fixed place" and "it cannot be too strongly emphasized that where an airplane is carried, its sole justification is its value as an adjunct in the navigation of the ship." In this writer's opinion, it will not be long before long-range aircraft operating from either aircraft carriers or more stable bases will be busy criss-crossing the length and breadth of the Antarctic Continent in an effort to grid-map the entire area.

In *The Antarctic Today,* meteorology is far too lightly dealt with, but in future treatments it will perhaps be otherwise

when ionisphere research, which is well referred to in the book, and which is rapidly revealing dependable means for radio or other communication, paves the way for more substantial economic use of the secrets of the weather.

It is in Part Seven and Chapters Seventeen and Eighteen that the casual reader will find human interest at its best, but as admirably stated in the Foreword, "A volume made up of personal narrative and summarized history was first proposed and may yet be prepared, for tradition is a strong bond of enduring value; but the needs for the moment seem to call for something different as a first venture." The "something different" in *The Antarctic Today* is a most praiseworthy example of encyclopedic effort, and every participant in its compilation is certain of hearty thanks both from all who have found interest in the Great White South as well as those who will discover interest in it in the future.

Hubert Wilkins

We are much indebted to Sir Hubert Wilkins for writing this review despite the pressure of last-minute details before departure on a U. S. Army research mission to the tropics.—Editor.

Camps and Climbs in Arctic Norway, by Thomas Weir. 85 pages, 58 photographs, 4 maps. London: Cassell and Co., Ltd., 1953. Price, 15/—.

Mr. Weir has written a charming account of a mountaineering holiday in Arctic Norway. He describes the climbs he made with his two companions, Douglas Scott and Adam Watson, and includes welcome glimpses of the people and the delightful informality of travel along the coast.

Most American mountaineers have heard of the jagged, glacier-hung peaks of northern Norway but know comparatively little about them. This book is good introductory reading and reveals their rugged character and beauty in text and picture. What may prove surprising to many is the extreme wildness of the area, the pioneering nature of many of the climbs, and the opportunity still extant for first ascents and new routes. Here the mountains rise directly from the shore; all is crag and pre-

cipice as though sea level were at timberline. It is good to know that such places are relatively accessible in all their unspoiled grandeur.

This is a small volume of only 85 text pages, with maps and beautiful illustrations by the author-photographer. It is essentially a simple story, well-told, informative, and an excellent example of good mountaineering literature. To all who love the mountain scene and would enjoy a glimpse of a spectacular land, it is most heartily recommended.

William O. Field

The Victorian Mountaineers, by Ronald Clark. 8vo., 232 pages with 45 photographic illustrations. London: B. T. Batsford, Ltd., 1953. Price, 18/—.

The author's paper in *Cornhill Magazine,* from which the present volume has been elaborated, was a remarkable one, and there are many courses to the resulting delectable feast. It places the Victorians in a true and surprising light, apart from their caricatures, as the bearded gentleman of family albums, who nevertheless developed the first considerable group of mountaineers. Without them, probably there would have been no Alpine Club, or other British climbing groups, and few of the English books of mountain exploration. The stage was set by the scientific activity of Forbes, by the original thought of Ruskin, and, not least, by the showmanship of Albert Smith. It was a part of the quest for fact, particularly physical knowledge, that drew the Victorian out of his sedentary life. Less complex than a desire for conquest, it was an actual escape, in many instances, from luxury, a revolution against ease. In a period of questioning, the scientist and the clergyman, climbing for the same reason, each sought his own answer in contact with Nature. Only slowly did mountaineering become recognized as a sport; but the Victorian on a summit was from the beginning certain that his adventure separated him from the ordinary mortal. If it did nothing else, it convinced him of his physical hardihood.

You who would live for a moment in the Golden Age will read this book, and many will be the great and lesser names that greet you: John Ball, Charles Hudson, Alfred Wills, John Tyndall, Leslie Stephen, C. E. Mathews, Edward Whymper, W. A. B.

Coolidge, and others. It is indeed a new Tyndall who delighted picnic parties by hanging from his heels from the highest tree to be found, and who would climb floating icebergs in the Märjelensee until they overbalanced and gave him a freezing bath. It is odd to hear from John Ball of American travellers at the Grimsel parting company through dispute on the theory of glaciers. Coolidge, the controversial figure from our shores, "The Boswell of the Alps," will be the subject of a future volume. Will D. W. Freshfield make a satisfying Dr. Johnson? It is a pity that Coolidge's contemporaries have all departed this life, for his biography would (and may yet) arouse as much controversy as did the publication of Whymper's *Scrambles.*

The portraits used for illustration, part of a larger collection shown publicly in London, are of utmost interest. That of Miss Brevoort is the most attractive yet to appear; other of the ladies are less favored. Yet all belie their abilities. It is interesting to note that the courier standing behind young Arthur of Connaught at the Grands Mulets in 1864 is the same Louis Peter who accompanied the American party of the Wilkinsons in the following year.

J. Monroe Thorington

Francis Younghusband: Explorer and Mystic, by George Seaver. 391 pages, maps and illustrations. London: John Murray, 1952. Price, 25/—.

Sir Francis Younghusband came of an old fighting family, with established traditions in the Indian army, but he himself seems never to have been entirely happy as a regimental officer. The phrase "wide open spaces" has today something of a phony ring, suggestive of the worst that Hollywood can produce; yet the draw of such spaces is undeniably felt by many, and in Younghusband may be regarded as the product of his adventurous spirit on the one hand and the strain of mysticism in his character on the other. Such a man might not fit easily into army life, but, with his abundant self-confidence, he was well equipped for exploration in Central Asia and the Karakoram-Himalaya regions at a time when they were almost unknown ground.

The author relates graphically the story of Younghusband's

great journey from Peking to India in 1887, which he himself described in a fascinating book, *The Heart of a Continent.* Explorations in the Pamirs, Gilgit, Chitral, and elsewhere followed, and in 1904 he commanded the Tibet Mission with patience and judgment. He incurred the disapproval of the then Secretary of State for India by signing the Tibet Treaty, and Dr. Seaver in a useful chapter brings out clearly how justified Younghusband had been and how unfairly he was treated.

The mystical strains in his character found vent in later years in founding the World Congress of Faiths, and he corresponded with philosophers such as McTaggart in his efforts to sift and straighten out his religious convictions which the silences of great mountain regions had for long been etching into his mind. He never lost his interest in mountain exploration, and as President of the Royal Geographical Society and as Chairman of the Mt. Everest Committee he brought all his enthusiasm to bear.

This is a good biography of a remarkable man and very well worth reading.

T. S. Blakeney

The Grace of Forgetting, by Geoffrey Winthrop Young. 352 pages, with 29 photographs and 5 line illustrations, including 2 maps by Leo Vernon. London: Country Life, 1953. Price, 21/—.

Geoffrey Winthrop Young's latest book is made up of memories —all "pictures in colour," as the author explains—of life at his family's island home on the Thames; of journeys to Mount Athos, among the Aegean islands, across Asia Minor; of service in the first War as a correspondent and then as a member of ambulance units in Flanders and on the Italian front. There are brief glimpses also of life at his "second home" in Ireland and at Monte Fiano, above Florence, and of excursions in the Pyrenees and in Massachusetts. No doubt each reader will remember a different set of "pictures." I have noticed Balfour's "very long brilliantly striped socks," lifted high on the side of the punt in which he reclined; the "blood-red head-scarves" on the "Greek pirates of villainous aspect" who acted (or, rather, failed to act) as crew of a boat chartered at Salonika by the author's

brother; "the great white wall overhung with vines and the cherry-tree in blossom" at Monte Fiano; "the crash and flare of unintermittent explosion" at Ypres; the golden oriole flashing among green trees at Gorizia. (I observe that the reviewer in the *Times Literary Supplement,* 15 January 1954, has indeed made a different list.) Everyone, I should think, will remember how after Caporetto the author, who had recently lost a leg, coped with an intolerably officious Italian captain: "I vaulted forward on an armswing over the bonnet of my car, caught the captain's wrist, and discharged my most throaty Florentine curses in counterblast to his abusive yelps." *The Grace of Forgetting* has little to do with climbing, but it reveals something of our distinguished Honorary Member and of a way of life. So does his poem "Laughter," in *Wind and Hill,* from which the title of the new book is drawn. To read Geoffrey Winthrop Young is still to wish for more.

D. A. Robertson, Jr.

British Crags and Climbers, edited by Edward C. Pyatt and Wilfrid Noyce. 235 pages, 16 illustrations. London: Dennis Dobson, 1952. Price, 21/—.

A stated purpose of this anthology is "to illustrate the foundation, the development and the present state of British climbing." Drawing on books and journals that are described as generally difficult for the individual to come by nowadays, the editors have arranged 54 pieces of prose in chronological order, running from Tyndall's account of "A Stormy Day on Helvellyn" (*Saturday Review,* 1859) to the record of a climb on Craig Cwm Silin in 1950. The Lake District, Wales, and Scotland are represented about equally; the last 20 years rather more extensively than the preceding 30 or those before 1900. One reads of the first ascent of the Napes Needle in 1886 and of J. L. Longland's climb on Clogwyn du'r Arddu in 1928. There is a footnote to Dr. Collie's story of the Long Man of Ben MacDhui, and a memorable answer by J. M. Edwards to the question, *How* do you climb? Two Everest men write of mild hills near home—Frank Smythe of the Surrey hills, Wilfrid Noyce himself of the Malverns. Many of the familiar names are to be found—Owen

Glynne Jones, P. M. A. Thomson, Geoffrey Winthrop Young, W. H. Murray, A. D. M. Cox. The Introduction and the annotated Table of Contents provide historical background and technical information.

The main point is that *British Crags and Climbers* makes good reading and evokes pleasant memories. I hesitate to say much more. The *Journal of the Fell and Rock Climbing Club* has been drawn upon only twice—but perhaps that is because it supplied all of an anthology published in 1948 (*Lakeland Scene,* ed. Mary Rose Fitzgibbon). The special quality of climbing from Pen-y-Pass, not infrequently alluded to in books and essays, might have had some space—but Geoffrey Winthrop Young's chapter in *Mountains with a Difference* and his essay in *The Mountains of Snowdonia* are (one assumes) generally available. Just one other comment: a different selection of pictures would have done more, I think, to bear out the editors' purpose to show how British climbing has developed. Might there not be illuminating differences, for instance, between photographs by the brothers Abraham and photographs by C. D. Milner? Or between a diagrammatic sketch for *Climbs on Lliwedd* (1909) and a drawing by C. H. French or W. Heaton Cooper for one of the guidebooks published in the 1930's? Perhaps this is to ask for another book altogether, an "essay in graphic history." That would be interesting, too.

D. A. R., Jr.

Instruction sur la Practique de l'Alpinisme et du Ski, issued by Secretariat d'Etat à la Guerre. 325 pages, including appendices and index, and 259 line drawings. Paris: Editions Berger-Levrault, 1953.

This is a military manual for the training of troops in handling themselves on mountain terrain in climbing and in skiing. It is, on the whole, well conceived and well put together. The entire technique of climbing has been condensed and put into a simple form with little attempt at elaboration or description of alternative methods. This would naturally be expected in a manual of this sort where uniformity in operations was a desired objective. It is understandably more compact and streamlined

than the very excellent *Manuel d'Alpinisme,* published by the Club Alpin Français in 1934, and as a consequence, will probably be found more adapted for use in the field. Perhaps the most striking thing in the book is the reduction of the number of knots mentioned to the overhand loop and the square knot, neither of which has been considered adequate by most climbers for some years now, and the latter of which has been found decidedly dangerous when used in nylon rope. The only other knot mentioned is the Prusik knot for rescue operations.

The book covers most of the standard climbing techniques and has a very complete section on rescue operations, which will be found useful and interesting by almost all climbers. A praiseworthy deviation from the usual in this book is the attempt at codification of rules for the use or non-use of certain equipment such as crampons, for example, according to the snow conditions and steepness of slope. While it might perhaps lead to generalizations which could be dangerous if followed without the all-important factor of human judgment, the idea has some merits, which might profitably be explored further by those interested in the teaching of mountaineering precepts.

In skiing, of course, the accent is on control and not falling, quite important when laden with a heavy pack. As a consequence some things, such as the use of the poles for braking and turning, which have been omitted from the ski manuals for many years, are mentioned, although briefly.

The appendices cover such things as preparatory physical training, organization of ski races, climbing and ski diplomas, and teachers' certificates. The index is very brief but helpful in a checking of detail. The format is utilitarian and compact, and the size is small enough to enable the book to be pocketed, but large enough to allow good-sized figures in the drawings, which are very clear. A large part of the instruction work is carried by the drawings, and the text is thereby kept at a minimum. The book is not only an interesting illustration of French military mountaineering practice but can contribute helpful hints to experienced climbers as well. Kenneth A. Henderson

Alpiniste, Est-ce Toi? by Alain de Chatellus. 174 pages, 15 illus-

trations. Paris and Grenoble: B. Arthaud, 1953. Collection Sempervivum. Price, 690 frs.

M. de Chatellus' subject is that always fascinating one, the psychology of the mountaineer. More particularly, he is concerned with the motives and attitudes of that elite group of climbers who have recently been engaged in conquering the precipices of the Dolomites and the great north walls of the western Alps. His thesis is that for those who undertake such climbs the factor of risk—indeed, of extreme risk—is not only acceptable but constitutes a chief attraction. In developing this idea he makes some interesting distinctions. The English, he thinks, have been least affected by such motivation and consequently have been left behind in the competition for the great Alpine first ascents; the Germans and Italians, while taking most of the climbing honors, have carried matters to pathological excess; the Swiss and French have struck a mean which he approves.

One should not misconceive the tone of the book. M. de Chatellus writes modestly, as one who has not himself accomplished climbs of the sort in question, but who is reporting sympathetically on what he finds among his associates of the Groupe de Haute Montagne. He is a keen and sensitive observer, able to give many striking little pictures of climbers in situations grave and otherwise. The defects of the book stem from an insufficiency of the scientific attitude and method. More evidence would have been welcome in support of the main view, especially in respect to its possible nuances. One wishes, for instance, that M. de Chatellus had exploited his opportunities to cross-examine his friends of the great ascents with regard to their precise feelings and reactions in various situations of stress, and given us, anonymously if necessary, information on what they have been too reticent to confess in their own written accounts. And psychological analysis could have been carried much farther, under the guidance of a more critical standpoint. For instance again, to any reader of this book the question will inevitably occur: How then is mountaineering supposed to compare with war, the typical occasion of risk and danger? G. W. Young, who has had intense experience of both, feels that they

are poles apart. M. de Chatellus represents the Germans as holding that the two are one. If the French school stands somewhere between, just wherein are war and mountaineering thought to resemble each other, and wherein to differ? A detailed answer to this question should be most illuminating. But M. de Chatellus gives war only a passing mention, on only a few occasions.

In spite of such inadequacies, the book is important and deserves a wide reading. It is effective, I think, in producing a realization that the type of climbing discussed is a characteristic and widespread modern phenomenon which is here to stay, and not just a bit of extremism on the part of a relatively irresponsible few. Sooner or later, in Britain and America, we too shall no doubt have to reckon with this tendency.

Robert L. M. Underhill

Oesterreich: Austria, her landscape and her art, by Viktor Griessmaier. 60 pages of trilingual text, with 336 full-page photographs. Vienna: Anton Schroll, 1950. Price, $11.00.

The newest and most comprehensive pictorial work on Austria, this book portrays the landscape in its variety and charm, with its towns and villages, its lakes, rivers and mountains, whose beauty is world renowned. It gives a remarkable idea of this small country in the heart of Europe, especially as regards its castles and dwellings, its rich art treasures and other memorable aspects.

J. M. T.

Ost-Tirol, Land-Volk-Kunst, by Franz Kollreider. 46 pages of trilingual text and 120 full-page photographs by Jahn-Dietrichstein. Innsbruck: Der Tiroler Graphik, 1951. Price, $2.50.

This is the first book dealing exclusively with the country, people, and art of East Tyrol. The text covers this concisely, while the illustrations depict the mountain uplift of the Venediger and Glockner areas, with particular emphasis on the happenings below the snowline. There are exhibits from the museum of peasant art at Leinz, as well as examples of the work of two contemporary artists: Franz v. Defregger and Albin Egger-Lienz.

J. M. T.

Kärnten, by Gabriel Rossmanith. 24 pages of trilingual text and 167 full-page photographic illustrations. Klagenfurt: Verlag Carinthia, 1951. Price, $2.50.

Here is the most satisfying book on the Austrian province of Carinthia that we have seen, and is understandably now in its second edition. Largely dealing with the countryside, its people, castles, customs and costumes, it yet includes the Gross Glockner and other peaks, as well as alpine flora and fauna.

J. M. T.

Kärnten and Osttirol, edited by Eduard Mussger. 200 pages of photographs with interspersed trilingual text. Klagenfurt: Mussger, 1952. Price, $2.50.

This book initiates a regional series issued under the title of "Sonniges Alpenland," with further volumes on Austria to follow. The history is supplied by Hermann Braumüller and the poetry by Wilhelm Rudnigger, while the photographers bring to one's attention areas of the Eastern Alps, particularly in Carinthia, that are little known to American tourists. The Gross Glockner and the Hochalmspitze are among the summits depicted; but the castles and churches, such as Hochosterwitz and Maria Saal, near Klagenfurt, should not be neglected by anyone visiting the area.

J. M. T.

Das Glocknerbuch, by Oskar Kühlken. 308 pages, with 9 reproductions of period etchings, 12 pen drawings in the text, 2 double-page diagrams of the Glockner massif, and 39 full-page photographs. Salzburg: Verlag "Das Bergland Buch," 1951. Price, $4.00.

The Gross Glockner is now the highest peak in Austria. In a book worthy of its subject we are given its history, the various routes for climbing, and a symposium on the development of skiing in the region. We learn of the French surgeon, Hacquet, who discovered a feasible route eight years before Saussure ascended Mont Blanc, leading to Cardinal Salm's expedition of 1799, when the Klein Glockner was attained, and the conquest

of the highest point in the following year. One thrills at the ascent of the north couloir by Pallavicini, where his guide Tribusser cut 2000 steps, followed by the count's tragic death on the Glocknerwand in 1885. This is but part of the mountain's story, leading to its final degradation in the present horror of the Glockner road.

J. M. T.

Das Buch vom Wilden Kaiser, by Fritz Schmitt. 328 pages, with 24 illustrations. Salzburg: Verlag "Das Bergland Buch," 1953. Price, $4.00.

As an example of what a regional book for mountaineers should be, this can scarcely be excelled. These peaks, between Kufstein and Kitzbühel, form a rocky wonderland well known to American climbers. One begins with the prehistory; of a cave on the western slope where the bones and implements of bronze-age men were found, together with one perfect shell from the Mediterranean, to show that they were Illyrians of 4000 B. C. We hear the legend of the peasant who trapped chamois by putting grease on the rocks, only to have the protecting dwarf direct the miscreant's own cattle over the precipice, which is now known as the Fleischbank. This is but preliminary to detailed description of the climbing, most of it of the greatest difficulty, as adequately evidenced by the illustrations.

J. M. T.

Living Country Customs in Salzburg, by Prunella C. Pott-Flatz. 64 pages, with illustrations from the author's pen drawings. Salzburg: Karl Gordon, 1950. Price, $1.00.

This little book, written in English, is sponsored by the Folklore Department, Government of Land Salzburg. It presents the year's round of Salzburg customs, seen with foreign, yet happily understanding, eyes. It begins with the Twelfth Night march in honor of Perchta, the Germanic goddess of nature, and follows the seasons through Palm Sunday and St. George's Day to Corpus Christi and the Riders of St. Leonhard, the Return from the Alp in autumn, and finally Advent and the Twelfth Night Wassail Singers.

J. M. T.

Erzherzog Johann, Der Steirische Prinz, by Viktor Theis. 175 pages, with 6 illustrations. Graz: Verlag Böhlau, 1950. Price, $2..00.

Archduke John of Austria was born in Florence in 1782 and died at Graz in 1859. In an eventful life he was adored by the mountain peasants, whose interests he in turn protected, and this mutual regard was not lessened by his morganatic marriage to Anna Plochl, daughter of the Aussee postmaster. Although this book deals largely with the archduke's political life, it is well to remember that he was a pioneer in the Eastern Alps. He made the first ascent of the Wiener Schneeberg in 1802 and instigated the first ascent of the Ortler by Gebhard and Pichler in 1804. He ascended Ankogel and Gamskarkogel in 1826, and Hohen Priel in 1829. In 1828 he was one of a party attempting the Gross Venediger from the west side, gaining a point 200 m. below the summit, and only desisting when Rohregger, his leading guide, fell.

J. M. T.

Südtiroler Volksleben, by Karl Th. Hoeninger. 104 pages, illustrated from 170 paintings and sketches by Albert Stolz. Innsbruck-Vienna: Tyrolia-Verlag. Price, $2.50.

Albert Stolz was the artist chronicler of the southern Tyrolese people, his work done primarily in Bolzano, where it is to be seen in frescoes of public and private buildings, in inns and hotels, as well as in galleries and numerous publications. Stolz was born in 1875 and died in 1947, losing his studio and a lifetime of work in the bombing of his city in 1943. Fortunately his major compositions were widely distributed and are still extant, his gaiety recorded in the harvest frescoes for the Villa Defregger, his many studies of peasant life, and even in the remarkable Dance of Death for the churchyard of Sexten, where Sepp Innerkofler lies. The text by Hoenninger is largely biographical, with a full exposition of the artist's recording of his time.

J. M. T.

Südtirol, by Josef Weingartner. 170 pages, with 33 color plates,

100 text illustrations by Robert Zinner. Vienna: Adolf Holzhausens Mfg., 1950. Price, $5.00.

In a readable text Weingartner describes the Eisach and Puster valleys, the Dolomites, the castles of the Vintschgau, and the areas subtending Bolzano and Merano. But the importance of the book rests in the pictures by Zinner, whose little studio is in the garden of the Hotel Grifone at Bolzano. They bring back memories of the Brenner road and of the pageant of history that has flowed through it and its lateral tributaries, making for splendid recording.

J. M. T.

Südtirol, by J. G. Oberkofler. 157 pages of full-page photographs by Hugo Atzwanger, with interspersed sections of text. Innsbruck-Vienna: Tyrolia-Verlag, 1950. Price, $3.00.

South Tyrol has many names, among them The Land of Mountains and Glaciers, the Land of the Dolomites and the Vineyards. There is a magic in the way it draws one, and a longing to return will sweep over anyone casting an eye through such a book. The views of the central Dolomites, adjacent to the Schlern and Rosengarten, are particularly satisfying.

J. M. T.

Dolomitenland, by L. Franzl. 16 pages of trilingual text, with 160 full-page illustrations. Bolzano: L. Franzl, 1948. Price, $3.50.

This book does not deal with climbing, but contains some of the most magnificent photos of landscape, peasant life, costume, and customs that one can possibly imagine. Many remote corners have been visited, with results that will make the amateur photographer despair. Altogether a good reason for owning it.

J. M. T.

Aus den Sextener Dolomiten, by Otto Langl. 191 pages, with 23 photographic illustrations. Vienna: Verlag der Oesterreichischen Bergsteiger-Zeitung, 1951. Price, $2.00.

The author is a distinguished Austrian climber, whose first and last love for half a century has been the Dolomites of Sexten.

He has returned to these peaks through a period broken by two wars, and has seen the villages rise again from destruction. His extensive climbing, while excellently described, cannot, in the reviewer's opinion, compare with his charming sketches of the local people he has known, particularly the guides, famous in the tribe of Innerkofler. Among the pictures is the grave of Sepp Innerkofler, as well as the Dance of Death which Albert Stolz did for the Sexten churchyard. The proud and touching verses of the latter are memorable.

J. M. T.

Dolomiti di Brenta, by Ettore Castiglioni. 498 pages, with 7 maps, 95 sketches, and 16 photographs. Milan: Club Alpino Italiano, 1949.

Dolomiti Occidentali, by Silvio Saglio. 269 pages, with 82 drawings, 28 photographs, and 5 maps. Milan: Touring Club Italiano, 1949. Price, $3.50.

These two guidebooks are models of their kind, each dealing with a limited region. The first details the climbing between Madonna di Campiglio and Trento, the massif culminating in the Cima Tosa. It does not include the more westerly situated Presanella and Adamello groups. The second book does not offer high climbing but is a pedestrian's guide from refuge to refuge, limited to the western Dolomites: Marmolada, Sella, Pale di San Martino, Sasso Lungo, Alpe di Siusi, Catinaccio (Rosengarten) and Latemar. The Cortina and Sexten peaks are excluded.

J. M. T.

Bosco Gurin, das Walserdorf im Tessin, by Tobias Tomamichel. 8vo., 155 pages. Illustrated with 83 pen drawings by Hans Tomamichel, 4 diagrams, and 2 sketch maps. Basel: G. Krebs, 1953. Price, Sw.F. 9.75.

Bosco Gurin, the only German-speaking village of the Ticino, celebrated its 700th year in 1953. The book is written by a native and the artist is his brother, making an authentic document of personal experience. Shortly before 1250, men from the

Valais, speaking an Alemannic dialect which has persisted, migrated south of the Alps via the Gries Pass to Pomat and recrossed the Swiss border to found Bosco Gurin in the Val Maggia, north of Locarno. Here is the history of a community of 200 inhabitants that for seven centuries has preserved its linguistic and cultural characteristics. The publication is the ninth in the series "Volkstum der Schweiz," issued by the Swiss Folklore Society. The illustrations show, among other things, the unique carving of distaffs, loom-shuttles, and cradle-boards.

J. M. T.

Der Alpensteinbock, by Carl Ausserer. 8vo., 243 pages, 11 facsimiles, 13 photographs, and 2 maps. Wien: Universum, 1947. Price, Sw. F. 7.70.

Now in its second edition, this book presents the life-history of the ibex which, despite the conservation attempts by Emperor Maximilian I, disappeared from the Austrian Alps early in the 16th century. Its reintroduction from the Gran Paradiso area of Italy has proved successful, as it has also in Swiss and French areas, so that its perpetuation is reasonably certain. The text evidences thorough research, and the illustrations, particularly those from ancient documents, are of exceptional interest.

J. M. T.

Austria, by Monk Gibbon. 8vo., 258 pages with 98 photographic illustrations, index, and 2 maps. London: B. T. Batsford, Ltd., 1953. Price, 18/—.

A companion to John Russell's *Switzerland* (1950), this book offers an excellent general survey of Austria. The wealth of detail, however, is overwhelming, as must be the case with any attempt to convert an abridged Baedeker into readable prose. It is inevitable that one should turn from the text to the well-chosen pictures which make the entire series so attractive. For one who has lived in and written additionally about Austria, it is incredible that the author has confused (p. 109) the mountain-loving Archduke John of Hapsburg (1782-1859) with Archduke Salvator of the Traunsee who, under the name of Johann Orth, vanished at sea in 1891. It is equally odd to find a pre-

sumably capable writer using interchangeably in the same chapter (IX) such forms as The Tyrol, Tirol, Tyrolean, Tirolese. Goldenes Adler (p. 197) should be Goldener Adler. The background of the Goldenes Dachl (photo 75), Innsbruck, is certainly not the Dolomites.

J. M. T.

Guide to the Colorado Mountains, edited by Robert M. Ormes. 188 pages, 32 maps, 34 illustrations, 6 in color. Denver: Sage Books, Inc., 1952. Price, $3.50.

This is a joint endeavor in which Mr. Ormes and the Guide Book Committee of the Colorado Mountain Club have brought together the knowledge and experience of those most familiar with the Colorado Rockies. Ormes has worked out an excellent method of handling the enormous amount of material so that it is of the most use and interest to mountain lovers, whether they are interested primarily in technical mountaineering or feel the many other attractions of being in the hills. A person interested in a hiking trip receives good general information and directions which will permit him to make the most of his mountain holiday. The climber interested in the more difficult ascents also gets good directions, and the approaches to the major mountain areas are clearly indicated. In this reviewer's opinion, the handling of the route descriptions on specific peaks is excellent and follows the tradition of American mountaineering in which route finding has always been a major—and most satisfying—element. The descriptions are not given in the detail of many European guidebooks but are completely adequate for the climber interested in finding his own way.

This book is a valuable addition to mountaineering literature, and in the breadth of its coverage and the lively spirit with which it is written it will do much to make the Colorado Rockies more accessible and satisfying to all of us.

William P. House

Peterli and the Mountain, by Georgia Engelhard. 40 pages, 8 illustrations by Madeleine Gekiere. Philadelphia and New York: J. B. Lippincott Co., 1954. Price, $2.25.

This is an unusual mountaineering story, being the adventures of Peterli, a fine red cat with a bushy tail, who felt impelled to traverse the Matterhorn. "Here are a lot of people going to the top of a big mountain. Surely, they must have a reason for doing it . . . I think I'll go along with them . . . Maybe I'll find mice up there." Peterli proves an intrepid climber, as no one will doubt who has ever been followed up a mountain by a cat. In fact, he is the first on the summit!

Peterli, his fond owners in Zermatt, and his great friend the guide Emil are lovingly drawn. His adventures both on the Swiss and Italian ridges are very convincing and should prove exciting to cat lovers of all ages. Madeleine Gekiere's illustrations add greatly to this delightful tale, and the story is founded on truth. The original feline conquerer of the Matterhorn was, however, less loyal to his local valley than Peterli and is said to have remained for ever after, guzzling mice in the hut on the Italian side!

Ursula Corning

Island of the Blue Macaws and Sixteen Other Stories, by James Ramsey Ullman. 320 pages. Philadelphia and New York: J. B. Lippincott Co., 1953. Price, $3.50.

This collection of seventeen stories, selected by the author from the 40 he has written since 1939, makes good reading. As he says, "Geographically they cover a good deal of ground: from Times Square to the Amazon, the Alps to Hawaii, the Yankee Stadium to El Alamein." All but one have been previously published in magazines.

Top Man is a good example of the way Mr. Ullman turns mountaineering into a good story, playing nationalities against one another as in *The White Tower.* Here we have the cautious Briton and the impulsive young American on an unconquered Himalayan peak. In *Mountains of the Axis,* the author deals with dare-devil young Nazi climbers of the war period who brought their new and shocking philosophy to the sport. Another mountaineering story, *An Easy Day for a Lady,* brings a climber back nostalgically to the scene of early climbs.

Mr. Ullman does best when he has nature as a background,

in the jungle or in the high mountains. Then, in a straightforward manner, his characters move from beginning to end by the shortest course.

Evelyn Runnette

Knots for Mountaineering, Camping, Climbing, Utility, Rescue, Etc., by Phil D. Smith. 24 pages, 5 pages of illustrative diagrams. Pamphlet-bound. Twenty-nine Palms, California: The Desert Trail, 1953.

This booklet covers 55 knots, hitches, etc., each illustrated with one or more drawings by Rodney H. Smith. The presentation cannot be classed as one for the beginner. While the drawings are lucid and well executed, some of the knots require more stages for clarity. Methods of tying are always difficult to learn from a verbal text, and these would be no exception. The author breezes through them in an authoritative but sketchy manner. He assumes a common understanding of such words as hitch, reeve, standing part, loop, bend, bight, etc., terms which in practice require carefully defined meanings. The treatment contains numerous sound points about utilization of the knots and about their comparative virtues.

Robert M. Ormes

Various Notes

UNITED STATES

A.A.C. and C.M.C. Joint Outing, Needle Mountains, Colorado, July 19—August 9, 1953. The Needle Mountains form a small part of the mass of mountains in the southwest quarter of Colorado, generally called the San Juans. They are located on the east side of the Animas River, 10 to 20 miles below Silverton, and are made up of several ranges, principally a north—south range about 6 miles east of the river and 4 east—west ranges separated by streams which rise in high basins near the foot of the mountains and fall in steep cascades down to the river. The stream second from the north was so little visited that it was never named, even locally, and eventually came to be called Noname Creek. It was in the basin at the head of this creek, at an altitude of 10,700 feet, that the base camp for the 1953 joint outing of the American Alpine Club and the Colorado Mountain Club was established. The outing lasted from July 19th to August 9th, and 94 people, from age 7 to 70, attended at least part of the time. Most of the A.A.C. members were in attendance for the last two weeks.

To reach the base camp we traveled individually to Durango, and from there took the narrow gauge Durango—Silverton passenger train through spectacular Animas Canyon to the mouth of Noname Creek. Because the track was on the west side of the river and there was no bridge, we had to be carried across on a cable tram operated by manpower. From there pack horses took our packs and we hiked up the trail, which zigzagged up 2000 feet in the first few miles to reach the lower end of Noname basin. Fortunately we were spared the rain that bothered others on the trail and reached camp before dinner time, just when word came of the injury to Phyllis Anderson from a fall while descending North Thumb. It was an inauspicious beginning for

an outing, but when she had been brought to camp that night, it was learned that her condition was not as serious as was at first feared and, except for the drafting of all competent men to carry her to the train on Wednesday, the program of the outing went ahead as scheduled. Much of the lessening of the tension was due to the cheerful optimism of Phyllis herself.

During the first week in camp it rained, at least several showers every day, and all day on other days. While Phyllis was being carried down the trail even some hail fell. Climbing trips went ahead as scheduled despite the rain, but by the end of the week, during which we had no chance to dry out our clothing, the wet weather was becoming monotonous and some who had planned to stay two weeks left at the end of one. The next day was clear and from then on we had no rain—not even on the day we hiked out—although on that morning the weather looked threatening, and the following morning in Durango it was raining.

Except for Mts. Windom, Sunlight, and Eolus, which almost everyone felt obliged to climb because they all exceeded 14,000 feet but offered no difficult climbing problems, the most popular climbs were those of Sceptre and Monitor Peaks, just southwest of the camp, and Jagged Mountain and Knife Point to the east. More interesting climbs were on the Twin Thumbs south of Camp and Pigeon Peak and the Index on opposite sides of Ruby Basin, just south of Noname basin. The latter two climbs would have been much more popular except for the long hike down Noname Basin or over the saddle into Ruby Basin before beginning the climb. These summits are all over 13,000 feet.

All of the major peaks in the Needle mountains had been previously climbed, but there are still numerous unclimbed pinnacles offering challenge to the rock climber. One of these, Gray Needle, at the west end of Jagged Mountain, was first climbed by a party from the outing. Expansion bolts were used on one 30-foot stretch of the climb. New routes were worked out for the ascents of Sunlight, the Twin Thumbs, and Animas.

Those not caring for the strenuous climbs had plenty of entertainment. There were spectacular vistas surrounding camp and other views within a short walk in almost any direction.

Everywhere flowers grew in unbelievable profusion. One day a committee collected and labeled a display which extended the entire 45-foot length of the dining table. One exhibit was a collection of Indian Paint brush of 27 different hues. Waterfalls and glacier lakes were within less than an hour's walk of camp. Entertainment was provided by members of the party at the evening campfires, after plans for the next day had been made.

Except those who left early because of the rain during the second week, everyone agreed it was a most successful outing, and the success was largely due to careful planning and management by Bob Ellingwood for the first week and a half and by Henry Buchtel for the rest of the time. Joe Hotter and his helper, Bill, did an outstanding job of packing us in and out and rendered outstanding service above the call of duty in getting aid after the accident. Ted Lee, of Calgary, Canada, proved that his reputation as an excellent camp cook was well deserved. The other members of the advance party and the outing committees had everything ready when the group arrived and kept the schedule running smoothly thereafter. The memories of the outing with its magnificent setting and especially of the old and new friends met there will be a high spot in the minds of all of us.

HENRY L. MCCLINTOCK

New Climbs in the Cascades. For those who tire of sea-level recreation in the Pacific Northwest there are always the ice-crested Cascades to beckon the adventurous, and to those adventurers not fully satisfied with following established routes there are still untouched summits and walls. One wall that marked the progressive quests of climbers this summer was the northern exposure of Mt. Goode, climbed from the northwest notch and over the hitherto avoided north summit by William Fix, Jim Henry, John Parrott, Don Claunch, and myself. The route, on steep fractured granite, was quite enjoyable, requiring the use of only two pitons. The nearby west tower of Goode was scaled on another trip to the area by Claunch and me. Insecure rock mitigated the usual reward expected from such a striking peak, but the ascent is quite worthwhile if one is already in the area.

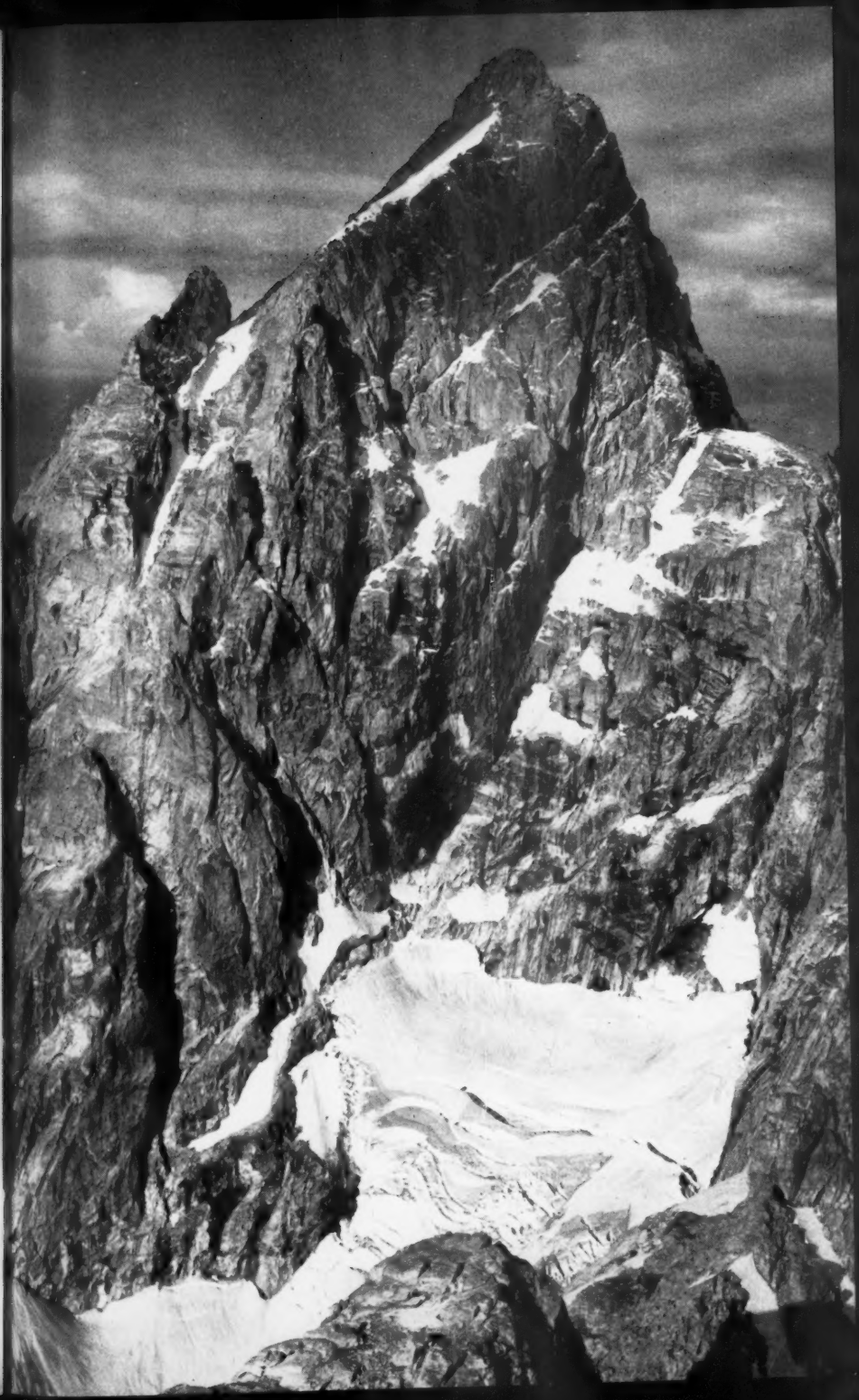
Most of this year's exploratory climbing efforts were consum-

mated on the far east side, in the Methow Range, north and east of Lake Chelan, amid a cluster of towering granitic spires surrounding Mt. Silver Star. One venture to the area resulted in new ascents of various towers on Snagtooth Ridge; another, the ascent of Silver Horn, by Joe Hieb, Art Maki, John Parrott, and myself. The principal quest, which after some preliminary probing, finally consumed almost three days of sustained piton climbing, was Burgundy Spire. John Parrott, Michael Hane, and I established camp on a rock outcrop of the Silver Star Glacier and in successive stages worked up the north face, leaving fixed ropes for faster renewed progress. A grim 200-foot face took almost a day to scale, and higher up, confused by various escapes from difficulty which led nowhere, we "direct-aided" up most of a 70-foot step which virtually overhangs the glacier. Late the second day we arrived at the first of several summit teeth, the highest, of course, being at the far end. Parrott, who had been coaxed into climbing to a small vantage point, announced that we should make the summit shortly on the next day. His plans for the quick conquest were not revealed, however; the next day when we returned, after further exploring we found no bypasses around the "teeth." His optimism was forgiven when he finally piloted a well-aimed rock, with a thin line attached, over the second tooth, and in time we were able to make a prusik-knot ascent to its exposed crown. From here the summit itself was reached in about an hour via a knife-thin edge and a summit-block overhang requiring the use of a bolt for aid (6 Rawl-drives were used on the climb). It had been a fascinating and stimulating problem, involving virtually every tactic of the rock climber; and to give just a little variety, Burgundy has a steep 300-foot frozen névé couloir leading into the face off the glacier.

FRED BECKEY

Tetons, 1953. The summer of 1953 saw a fever of climbing activity in the Grand Teton National Park unmatched by any previous year. Not only were the regular routes kept busy, but first ascents, new routes, and other unusual climbs were made

NORTH FACE OF THE GRAND TETON
from the summit of Teewinot.
Photo, L. Ortenburger



by the dozen. For example, the Grand was climbed by no less than eight different routes! The weather was important to the success of these activities—there was only one day of definitely bad weather during the whole summer.

NORTH FACE OF THE GRAND TETON

The first direct ascent of this face was made in 1949 when Ray Garner and the Teton Guides Dick Pownall and Art Gilkey finally cracked the defenses of the upper bulge of the wall,* but since that year the face had sustained no determined effort. The guides of the Petzoldt-Exum School of American Mountaineering spent long hours discussing another engagement with the face, but days off were hard to match with good weather conditions; so it was not until the past summer that another attempt could be launched. Again, as in the case of the Pownall-Gilkey-Garner party of 1949, it was the unexpected arrival of Mike Brewer which gave the guiding service sufficient manpower to allow two of them the necessary time off. Consequently, on the night of July 23rd Leigh Ortenburger and Willi Unsoeld were encamped with Dick Emerson, the park's expert climbing ranger, at the head of Teton Glacier. Much probing with ice-axes preceded the pitching of the tent since it was suspected that the campsite was actually the cover for a gigantic crevasse which had apparently disappeared since the previous year. This suspicion was verified three days later when the camp was retrieved by Willi and his wife, Jolene, just as the end of the tent was slipping into the widening chasm.

The start was made at 3:30 A.M. and, with the help of a headlight, the previously reconnoitered bergschrund was quickly passed. The rock was gained at the base of the large, rotten yellow chimney which lies to the right of the route. From the bottom of this chimney a horizontal ledge provides a promenade left to the broken rock which rises towards the first prominent snow-covered ledge. It may help to note that there are four of

*A.A.J., VIII (1951), 61-70.

WILLI UNSOELD TRAVERSING INTO THE Y
Photo, L. Ortenburger

these prominent ledges on the north face of the Grand. All run upwards to the right at an average angle of 45° and the route generally traverses along each before breaking upward to the start of the next. The first piton was placed at the start of the first upward lead, but the rock above, though rotten, was quite easy and progress was rapid. Unsoeld was leading here and was usually able to extend another full 120 feet while Ortenburger was belaying Emerson who carried the pack. The final black chimney giving access to the first ledge provided this section of the climb with its only real delicacy. Here the smooth black mica cleavage slabs reduced friction to an uncertain minimum and the leader was glad to snap into some of Petzoldt's old strap-iron pitons. Five of these were clustered in the chimney and still rang true to the testing hammer despite their having been placed 17 years ealier.

Since the party had reached the commodious first ledge at 6:00 A.M., they treated themselves to a second breakfast beside a stream of running snow water. The sun was with them by this time, but its cheering rays were balanced by the evil-looking thunderstorm which could be seen moving in over Mt. Owen. This storm proved to be the first of a succession which moved in and out of the field of view all day. Although none of them came close enough to constitute an actual threat, they did serve to keep the party moving steadily. Emerson now took the lead and easily kicked steps* up two snowfields as the rest followed the ledge to its end. The first lead above the ledge proved the the most difficult to that point, and Dick was forced to drive a second piton as well as to snap into a few pitons left by Pownall in '49. A second lead put everyone easily on the second ledge which was treacherously coated with slimy lichen and snow water; so instead of following it out to the right, as was done in 1949, Dick cut straight across it and angled up to the third ledge in one easy lead.

With Dick still leading, the party passed easily along the third ledge until they reached Pownall's "shallow chimney," which was

* Emerson was wearing bramani-soled boots, our standard footwear on all our climbs in the Tetons. We, at least, have decided that tennis shoes have very little, if any, use in mountaineering.

still well studded with iron. This pitch, now directly above, was the crux of the climb. They were in doubt as to exactly where Pownall had been forced to pendulum around the crucial corner, but as Dick slithered out on a tiny ledge 50 feet above the rest, he became more emphatic in his assertion that this *must* be the pendulum pitch. His belayer had a startlingly clear view of three-quarters of his torso (divided longitudinally), the other one-fourth serving to hold him onto the ledge by some unseen means. The ledge narrowed towards the corner and Dick peeped around it to discover another piton! The only possible conclusion was that Pownall had led this corner direct. After snapping in to the piton, Dick knotted his toes firmly in the crack that had once been a ledge and extended his serpentine body out and around the corner until he could reach a handhold. Hanging from his hands, he then swung around the corner and disappeared. Just after he had reached some slight irregularities which could be called footholds, further complications arose. His rope jammed in a crack at the corner,* forcing him to cling to his holds while Unsoeld led up to this corner and freed the rope. Then Ortenburger, the pack, and Unsoeld, in that order, followed the rope around the corner to Dick's belay stance.

The party was now on the fourth ledge. Ortenburger led up it for 120 feet to the point from which they could easily have walked over to the north ridge, now only 40 feet away. However, in the interests of being as direct as possible, they then turned their attention to finding a route to the bottom of the "V" which cuts the middle of the final summit mass. Leigh led again up a long crack starting some 30 feet to the left of Pownall's route and angling still farther left. About 50 feet up, a good angle piton was placed and a crack was followed up the right which required two more irons for safety. From here Leigh stepped out to his left on an extremely high-angle friction slab which provided him with 20 feet of delicate work. The slab led horizontally to the "V" and the actual climbing was over.

Despite the hour which had been spent on the "pendulum" pitch, it was only 11:30 A.M. when the party reached the sum-

*It is recommended to future leaders of this pitch that they carry a couple of gloves along to stuff into this crack to prevent similar difficulty.

mit register. It had taken only eight hours from their glacier camp. They had driven six pitons themselves and snapped into as many more, leaving by far the larger portion of the 36-piece assortment clattering merrily as they climbed. It made so much noise, however, that Mike Brewer who had been waiting with his guided party on the summit greeted the party's early arrival with the startled ejaculation: "You guys! I heard the clanking of iron, but I thought it was just some Sierra Clubbers coming up the Owen route!"

WEST FACE OF THE GRAND TETON

A week later Brewer and Ortenburger had a couple of days off from guiding. Both had talked to Henry Coulter about the West Face of the Grand. He and Jack Durrance had pioneered the climb in 1941 and it had not been repeated. At 1:30 P.M., July 31st, Brewer and Ortenburger took the boat across Jenny Lake and started up Cascade Canyon to set up a camp as high as possible in Valhalla Canyon, the starting point for their climb—a beautiful high cirque lying at the base of the west faces of the Grand and Mt. Owen. Arriving at their 11,000-foot campsite at dusk, they saw three conspicuous ledges or shelves sloping diagonally up to the left. They could see that the first problem was to get from one of these to the next higher one. It looked as if the third shelf would bring them to the base of the west face proper.

Starting before daybreak the next morning, they rapidly scrambled up an easy system of ledges leading toward the first main shelf. They roped up at the base of this shelf, where an easy route was found leading on to the second ledge. Several interesting rope lengths up, wet friction slabs on this shelf took them to the black rock at the top of the shelf. They could now look up and see the horribly rotten red chimney referred to by Coulter. They thought it the worst chimney in the entire range. It did, however, bring them to the ledge just above the steep icefield which everyone sees when looking down the north side of the upper saddle. They were now at the bottom of the west face, the great west face chimney beginning about 100 feet above their heads. This 100-foot wall separating them from the chim-

ney was unbroken as far as they could see to their right. On the chance that there might be a break in this wall, out of sight to the right somewhere, Ortenburger began chopping steps in the ice along its top edge. He was using an ice hammer, much handier to carry on these long face climbs than an axe. After moving about 50 feet, he looked up and saw an old rusty piton in an overhanging chimney—the route! It was not an easy chimney. After placing two more pitons for safety, he squirmed to the top of it. Brewer, however, had twice the problem since he was carrying the pack. Three more rope lengths put them on the large scree- and debris-covered ledge which is about even with the upper saddle.

Here, during brunch, Brewer complained loudly that it was Ortenburger's turn to carry the pack and, after looking at the ominous rock above, the latter quickly agreed that it was Brewer's turn to lead. Two quick rope lengths up the left side of the main west-face chimney brought them to the crucial point of the climb. They knew that Durrance had turned the blank wall above by making two sensational leads out on the face to the left. Before committing themselves to that route, Ortenburger thought that the chimney itself should be investigated. At this point, there is a large chockstone and, had it not been completely covered by ice, this variation might have been possible. As it was, they gained nothing but tired fingers and lost over an hour trying to force a route there. Now that they were convinced that the only possible route was the one taken by Durrance, Brewer resigned himself to his fate and began traversing to the left. After passing a large flake on the outside, he made this difficult lead directly upwards for perhaps 40 feet on very small holds to an outsloping ledge where a piton made a belay possible. When Leigh reached the belay stance, they discussed the next move—the only chance lay in a traverse back to the right on even smaller holds in order to get back into the chimney. This traverse (and indeed their belay spot, too) was very much exposed and would require some protection for the leader. So Ortenburger climbed out to the right, trying to drive enough iron to make the next lead safe—a maneuver which consumed much time since the piton cracks left something to be desired. With the mission ac-

complished, he returned to the belay spot to rest. Brewer was still fresh and eager and in no time had led safely across. Instead of stopping, he continued up to a corner some 30 feet above and beyond the traverse. This traverse proved to be easier than it appeared, but the 30 feet up to the corner where Brewer was belaying was difficult climbing.

And, unbelievably enough, Brewer was still not through. From this corner he climbed directly up over an extremely difficult overhang, which had Ortenburger completely baffled. He mumbled something about "unclimbable" and berated Brewer for not traversing back into the chimney as he should have done, but with a little tension on the rope Ortenburger got over this spot. Finally, they began scrambling up the now easy way to the summit.

NORTH RIDGE OF THE GRAND TETON

The north ridge is the most commonly climbed difficult route in the Park. Planning to do the climb in one day, Doc Norman Lee, Mike Brewer, and Willi Unsoeld left Jenny Lake at 12:30 A.M. on August 6th and hurried up the trail to Amphitheater Lake where Ortenburger was impatiently waiting beside a crackling bonfire. Ruthlessly limiting themselves to two hours by the fire, they finally coaxed Ortenburger away from his cocoa and at 4:30 A.M. started for the glacier. A leisurely stop for breakfast halfway up the Grandstand was abruptly brought to an end by a few rounds of rockfall from the face above. Their appetites dulled, they sprinted up to the crest of the north shoulder and the beginning of the north ridge proper. At this point the party split forces, Lee and Ortenburger choosing to swing around the initial step to the right, while Brewer and Unsoeld climbed on the left. It became clear that the right-hand route is more difficult. Two or three rope lengths later the party joined again at the base of the chimney blocked by the famous chockstone.

The climb was made shortly after a snowstorm which had formed an ice cap atop the chockstone; this would have made the route up the line of pitons to the right of the chockstone almost impossible. Fortunately Paul Petzoldt had assured the party that the pitch wasn't so bad if one simply stemmed the chimney *facing out,* with one's back to the chockstone. Amaz-

ingly enough, this unorthodox technique was the key to the pitch, although the uninterrupted view of Valhalla Canyon below did little to steady one's nerves. Unsoeld was first pegged out on the wall to the right of the chock, from which vantage point he obtained an excellent quiver-by-quiver photographic record of Brewer's lead of the pitch. Ortenburger led the second rope, providing some interesting photographic studies as he stemmed out almost to the splitting point. However, it was Doc Lee who gave the technique the acid test. With his full 5 feet 6 inches extended to the elastic limit, he casually chimneyed up over the chockstone, finding opportunity along the way to retrieve the karabiners.

Above the chockstone is a model chimney just 100 feet high with walls machined to a precise width and holds perfectly spaced. A crack leading up from the chimney ends in an ordinarily simple friction slab, but that day it was solid verglas. Much time was used up in tinkering with this bit—tiny nicks were chipped with the piton hammer, areas were pulverized in an effort to bare the rock, and a limited area of snow-coverage was used to the full. Finally Unsoeld managed to skate up this very nasty pitch to the exposed corner at its upper end and the thin part was finished. From there, more straightforward climbing brought both ropes to the summit at about 4:00 P.M.

SYMMETRY SPIRE

No article on Teton climbing would be complete without some mention of Symmetry Spire, 10,546 feet, long the playground for one-day rock climbers. Of the ten routes up this little peak the Jensen ridge* (the ridge just east of the southeast chimney now known as Templeton's Crack) is by far the most difficult. The second partial ascent of this ridge was made on 6 August, 1952 by Doc Lee, Willi Unsoeld, Sandy Gregory, and Tony Mueller. The party climbed Templeton's Crack for about 300 feet before traversing out to the east in order to reach the crest of the ridge which was then followed to the summit. The unclimbed lower 200 feet of the ridge was examined on this occasion and a verdict in substantial agreement with Jensen was reached: "impractical . . . extremely forbidding."

*A.A.J., III (1939,) 361-362. Account of the first partial ascent.

After some discussion they decided that it must be considered impractical only if no direct aid is used. A possible direct-aid crack seemed to lead straight up the nose of the ridge to the first large overhang which was poised some 80 feet above the gully. On 14 August, 1953, Lee and Unsoeld were back again and spent four long hours pounding their way up to a small platform 20 feet below the overhang. A half dozen pitons were used for direct aid in cracks which were generally too inadequate to insure much peace of mind. From this platform the route over the two large overhangs proved quite enjoyable with only six pitons being used for safety up to the point where the ridge had been gained the previous year. Lateness of the hour forced the climbers to retreat and they rappelled off into Templeton's Crack.

Two days later the indefatigable Unsoeld was back in his official capacity as Teton guide. With him were A.A.C. member Mary Sylvander and Steve Jervis. A closer examination of an alternative to the first unpalatable lead resulted in complete success. After traversing right from the base of the ridge, Unsoeld climbed a moderate pitch straight up, then diagonally to the left, and in a matter of perhaps 20 minutes had the entire party on the same little platform beneath the first overhang! This first obstacle is turned on the left by a vertical crack providing excellent handholds. Above it a small wall is surmounted (one piton for protection) and the route continued until one's head nearly bangs on the roof of the next overhang. A hand-traverse to the right along a flake brings one to the righthand corner of the overhang which is easily passed. This stretch takes the leader to an ample ledge a full 120 feet above his belayer.

From here the route traverses horizontally left across the crest of the ridge before turning upward again. If the groove nearest the crest is followed upwards, an extremely smooth and awkward wall is encountered at its top. Unsoeld placed two pitons for safety here and wished for more. At the top of this delicate 12-foot bit is the ledge which had previously been reached from Templeton's Crack. Above this the route becomes more nearly vertical, but the rock is splendid with excellent cracks for the utilization of cross-pressure. The final obstacle which the ridge has to offer is an 8-foot overhang with very steep slabs below it.

On the 1952 climb it was turned on the left after an unsuccessful try at the cleft in its center. This time, on the basis of Mary's unbounded optimism, the central cleft was again essayed by Unsoeld and finally yielded, but not without requiring a good deal of uncomfortable squirming by Unsoeld.

SOUTH RIDGE OF MT. MORAN

A few years ago Phil Smith had mentioned to Leigh Ortenburger that Bert Jensen had hiked into Leigh Canyon back in the '30's, intending to attempt the unclimbed south ridge of Mt. Moran, but after he had had a good look at it, he turned around and came back without ever setting foot on the rock. In June 1953 Bill Buckingham and Ortenburger had a good look at this still unclimbed ridge as they bushwacked out of Leigh Canyon. They noticed 1) that the ridge was 5000 feet long, making it one of the longest climbs in the country; 2) that there were a minimum of eight major towers on the ridge; 3) that the first 2500 feet seemed so smooth and sheer as to offer no route which did not involve at least 500 feet of direct-aid climbing. After making these observations Ortenburger gave up the idea. The whole subject of the south ridge of Moran became the joke of the summer among the climbers at Jenny Lake. Dick Emerson, however, had twice been up Leigh Canyon with binoculars and thought there was a chance that the ridge might go. Rational argument seemed to have no effect on him. On the August 16th everyone was shocked when he announced that the next day he and Don Decker intended to do a "reconnaissance" of the ridge —it seemed as if he had gone mad. Two days later everyone listened to Dick tell how he and Don had climbed over 2000 feet of the "smooth and sheer" section without using direct aid! This was so surprising as to be nearly unbelievable. Though if true, then perhaps the whole ridge could be done in two or three days.

Finally, on the evening of August 28th, Emerson and Decker, joined by Ortenburger, were camped in Leigh Canyon preparing for the assault on the morrow. Since the ridge was clearly more than a one-day picnic, they planned to spend one night in a bivouac, and since they didn't want to carry any more food

than necessary, they decided to eat in advance. More food was consumed that night than six men ordinarily eat. Up early the next morning, they began the first grassy ledge leading to the crest of the ridge. Here they picked up an enormous cache of iron that Dick and Don had left on their earlier trip. Roped up, by 10 A.M. they had reached the high point established by Dick and Don on their reconnaissance. In the intervening 1000 feet is to be found some of the finest rock in the Park, full of wonderful hand traverses, plus a fine chimney.

They then came to the left-hand corner of the smooth face of the ridge just 70 feet below the great overhang which caps the vertical section of the ridge. Ortenburger could easily see why the earlier party had been stopped previously. The face to their right was smooth granite, about 60 feet across and at an angle of 80°. On the far side of this face, however, they could see a perfect direct-aid crack which could take them to easy ground. But the complete absence of holds or even piton cracks between them and this crack made them look elsewhere for a route. The only other chance was to continue up the corner and try to avoid the great overhang by turning left. Dick started up, almost immediately being forced into direct aid by the nature of the rock. After a great deal of effort he succeeded in getting high enough to see that the route to the left would not go. Still not ready to tackle the face on their right, Ortenburger decided to have a look at the rock below the face via a tension pendulum from Emerson who was now 25 feet above. Dick lowered him about 50 feet, but he found nothing. He did find, however, that if they ever succeeded in traversing to the "easy ground" referred to above, there would be no retreat from it. Below it was an enormous overhang—a 120-foot rappel would leave one out in space. Emerson decided to give the face a good try before admitting defeat. The problem was to get across the 60 horizontal feet separating them from the direct-aid crack which they could plainly see. While belaying Dick, Ortenburger was back around the corner and could not see. Suffice it to say that two hours later Dick yelled "Off belay!" Ortenburger peered around the corner and saw that Dick was standing on a three-inch ledge at the base of the direct aid crack! From his position above Or-

tenburger, he had succeeded in climbing to the right a few feet to place a piton (a wafer driven in about 3/8") from which he made a pendulum to another hair-line crack; then he placed several more wafers up this crack until he was able to make another pendulum which took him to the ledge he was then standing on. Even with all the iron in and rope threaded through the carabiners, it was a very hard job physically to get across to Dick's position and mentally to figure out just how to snap in and out of the carabiners—so that Don also would be able to get across. After Ortenburger reached the three-inch ledge, Emerson did an expert job of nailing the direct-aid crack. Seven pitons later a shout told us that he had reached the easy ground. It was another hour before all three were reunited on a ledge a full two feet wide. By now it was 6:00 P.M.—eight hours had been spent on that one pitch! Dick had done an outstanding job of technical rock climbing.

The party thought that their troubles were over, but they were mistaken. Everyone agreed that the most likely route led straight up from their ledge. Ortenburger investigated this possibility, but when it turned into direct aid again, he retreated—all had had their fill of direct aid for a while. It was nearly dark then and something had to be done quickly if they were to avoid a bivouac on this windy two-foot ledge. Don Decker came to the rescue here and boldly tackled a fearsome hand-traverse leading out of sight around a corner to the right. After about 100 feet of rope slithered out, a tremendous whoop from Don told them that he had made it. This pitch was a real test of arm strength and Don did a beautiful job. When the others had joined him, they found that they were at last at the top of the 2500-foot buttress. The rest looked easy going, at least as compared to what they had been through. Lightning hurried them on their way across some slabs to a friendly grove of pine trees where they spent the night. With a good fire they passed a comfortable night on a mattress above pine needles.

At daybreak the next morning they were on their way. They had to reach the summit via 2500 feet of unknown ridge above them and return to Jenny Lake or else become benighted. Ortenburger led off up some easy slabs to regain the ridge. Here they

began wrestling with an unknown number of gendarmes. They climbed up, down, over, around, across, and through gendarmes the rest of the morning. The rock was excellent. As they had suspected, their difficulties were behind them; so at 2:00 P.M. they were sitting around the summit cairn signing their names in the register. After gorging themselves on the can of plums which Dick had left on the summit earlier in the summer, they rushed down the C.M.C. route, ran down the grassy slopes, and at dusk reached their rowboat which had been left at the mouth of Leigh Creek. With real contentment they took turns rowing back across Leigh Lake, watching the south ridge in the sunset.

LEIGH ORTENBURGER

ACTIVITIES OF THE CLUBS

A. A. C., Cascade Section. In the spring, just prior to the departure of the K-2 expedition, Dee Molenaar and Pete Schoening, of our Section, gave an excellent account of the plans for the trip and had available for examination various items of equipment.

Dee, Pete, and Bob Craig were all guests of honor at the annual fall meeting of the Section. At the same meeting Vic Josendal showed an interesting set of slides taken on his ascent of Mt. Robson during the 1953 season. Ralph W. Johnson of Seattle was elected Chairman of the Section for the coming year.

Several members of the Section took an active part in local mountain rescue activities during the past year. Ome Daiber and Ralph W. Johnson are members of the board of the newly formed "Mountain Rescue Council." These men, with George McGowan, engaged in two television shows on mountain safety, presented in Seattle; and these and other Section members have given many talks to climbing organizations, the Boy Scouts, and many other groups, on the subject of safety in the mountains.

W. H. BORROW

A. A. C., Sierra Nevada Section. Under Chairman Will Siri, Vice-Chairman Allen Steck, and Secretary-Treasurer Richard

Houston, the Sierra Nevada Section held four meetings during 1953. Included in the activities were programs by Maurice Herzog on Annapurna, Norman Dyhrenfurth on Everest, Dee Molenaar on K2, Fritz Lippmann on McKinley, and Willi Unsoeld on the Grand Teton. During the summer climbing months local members engaged in climbing on Mt. McKinley, Mt. Robson, and on many peaks in the Sierra Nevada, the Yosemite Valley, the Tetons, and Canada. Two members also served as guides in the Grand Teton National Park. Several members were engaged in preparations for the attempt on Makalu in 1954 with the California Himalayan Expedition. Membership in the Section now stands at 64, with an average attendance at meetings of about 25.

RICHARD C. HOUSTON

Chicago Mountaineering Club. Sixteen new members during the year brought the total membership to 140. Ten local outings were held from April through October with attendance of 273 members and 200 guests. During the outing period, the Iowa Mountaineers scheduled a few of their trips to coincide with ours so that the groups could share in climbing experience. Members and guests were given rock-climbing and safety instructions under the supervision of the Outing Chairman, Paul Stettner.

Our 6th biennial outing was held during the first two weeks of August in the southern Wind River Range of Wyoming. An advance party of eight set up camp at Lonesome Lake at the head of the North Fork of the Pope Agie River, elevation 10,187 feet. Fifty-seven participants reported a successful outing. Snow-school instruction and demonstration was given by Outing Chairman Paul Stettner. Good weather prevailed; parties climbed the numerous peaks in the area, including Lizard Head (12,842 ft., the highest peak), Pingora, Pyramid Peak, Mt. Washakie, and War Bonnet. The success of the outing was marred by the death of Karl Bollinger, a new member, who came to us after having had considerable climbing experience in his native Germany. The accident occurred on War Bonnet peak.

Six members joined the Alpine Club of Canada outing in the upper Whirlpool Valley in Jasper National Park. Dr. Guy Everett and Ed Porter were in the party making the second ascent of the south ridge of Mt. Hooker. Bob Schluter and Dr. Alex Fabergé spent eleven days in the northern Selkirks, making a first ascent of Mt. Chapman. David Bidwell joined the American Alpine Club outing in the Needles of the San Juan Range in southwestern Colorado.

Nine monthly programs featuring movies or Kodachrome slides were held for members and guests. Dr. Everett was elected to serve as the Chairman of the Middle West Section of the Alpine Club of Canada when the group held a special meeting in Chicago in June; Capt. Albert H. MacCarthy was an honorary guest at this meeting, the purpose of which was to organize the Middle West Section.

Other programs featured a lecture and demonstration of the dynamics of motion as applied to hiking, climbing, and mountaineering by Dr. Beckett Howorth.

Plans for the 1954 season include a Safety and Training Course under the supervision of Joe Stettner, a mountaineer of many years' experience, including a period of service as mountain instructor at Camp Hale in Colorado. This will be the second time a safety course has been given to our members; the first series was conducted in 1949. A series of discussions and theoretical lectures beginning in January will be followed by demonstrations and practice at the spring outings, in cooperation with the Outing Chairman.

MRS. HARRY LUMBY

Dartmouth Mountaineering Club. The summer of 1953 saw undergraduate and graduate members of the D. M. C. climbing in many areas. It is of interest to note that in the western United States 8 members visited the Front Range and 2, the Sangre de Cristo Range in the Colorado Rockies; 3, the Tetons and 1, the Wind Rivers in Wyoming; and 1, the Cascades. In the Canadian Rockies 5 climbed in the area of Lake Louise; 6, in the Purcells; and 1, in the Selkirk Range. One member visited the St. Elias Range and 3 members, the Swiss and French Alps.

The visit to the St. Elias Range was made on the east side by Percy Crosby '52 with the Canadian Geological Survey. He accomplished the first ascent of Neve Peak (ca. 10,000 ft.).

In the Purcell Range three members and two friends made a high-level traverse along the last unknown portion of the divide north of the Bugaboos, during which they discovered a large number of beautiful mountains and made the first crossing of the Conrad Icefield. Later, others made climbs from Boulder Camp in the Bugaboos.

Spring and fall rock climbing classes were held three times a week as usual.

The high point of the fall season was the weekend when members enjoyed the hospitality of the McGill Outing Club in the Laurentians. Attention was centered on the amazing chimneys at St. Marguerite and the Condor Pinnacle.

The Club is especially happy to welcome to its membership Charlie Furrer, registered guide from Zermatt, Switzerland, who is assisting Walter Prager with rock-climbing and ski instruction for this year and has become an enthusiastic participant in all of our climbing activities.

PETER ROBINSON

Harvard Mountaineering Club. During the summer of 1953, members of the Club conducted expeditions to British Colombia, Alberta, Peru, and Alaska. In British Columbia Bill Putnam and Harry Francis ran an 18-man climbing camp in the Northern Selkirks. In addition to training new men in the ways of big mountains, the party made a third ascent of Mt. Sir Sandford (11,590 ft.) by a new route and notable first ascents of the West Peak of the Blackfriars (10,490 ft.) and of Gibraltar (9,590 ft.). Also in British Columbia a four-man party succeeded in making four first ascents in the Spillimacheen and Carbonate ranges of the northern Purcells. In Alberta a party of three climbed Mt. Robson, which until 1953 had remained unclimbed for 15 years. In South America Fred Dunn led a party on several first ascents in the central Peruvian Andes, and Brad Washburn and Ned Ames did considerable survey work and climbed Peak C and Mt. Brooks in the Alaska Range near Mt. McKinley.

In the local areas the Club has continued its active rock-climbing program, with the introduction this year of a second-man training system, consisting mainly of special belaying practice. It is hoped that conditions on Mt. Washington will be favorable during the winter for instruction in cold-snow camping, as well as in snow and ice climbing. Under the auspices of the Safety Committee the Club is running a beginners first aid course again this year, the successful completion of which is a requirement for all Club leaders.

J. S. HUMPHRIES

Potomac Appalachian Trail Club. During 1953 the Mountaineering Committee continued its efforts to promote rock-climbing safety, with special emphasis on instruction in dynamic belaying and principles of leadership. A regular program of belaying practice has been initiated, and preparation of a movie showing various aspects of dynamic belaying is now in progress. The film should be available for distribution to other clubs within the next few months.

Our usual program of weekly local climbing has continued, and during 1953 participation in these trips has totaled about 1000 "climber days" without serious accident. Several groups of climbers from Pittsburgh have visited Washington to join in our local climbing and use our facilities for belay practice.

Eight members of the group climbed in the Coast Range of British Columbia during the summer and made four first ascents. Another party made several minor ascents in the Tetons and climbed the Devils Tower on their return trip. Five members of the committee participated in the Rock Climbing Safety Conference sponsored by the A. M. C. in New Haven.

During the year, *Up Rope,* the official publication of the Mountaineering Committee, entered its ninth year of continuous publication.

J. C. REED, JR.

Rensselaer Mountaineering Club. Although the R. M. C. is still small, climbing enthusiasm has kept the membership list increasing. Probably the most significant achievement in the

Club this year has been the publication of the first issue of *Rensselaer Mountaineering.*

Climbing for beginners, or "weekday climbing," is done at the Grafton Cliffs near Troy. Weekend climbing then centers around the Schawangunks. Despite the appalling lack of deep snow, winter mountaineering in the Adirondacks has continued to be an attraction during the cold months. In addition, a particularly good trip was made last December when several ascents of Mt. Katahdin in Maine were made.

As usual a few R. M. C. members found their way to Jackson Hole this past summer. A climb of the North Ridge of the Grand Teton is worth particular mention. Other members were on expeditions into the Bugaboos and the St. Elias Range. Finally, some excellent rock climbs were made in the Chapel Pond region of the Adirondacks.

FRANZ MOHLING

Sierra Club. The Sierra Club once again engaged in a large program of summer outings, including the 48th high trip into the Sierra Nevada, 3 burro trips, a base camp trip, 3 knapsack trips (one to Colorado), 2 family burro trips, and 2 river-running trips down the Green and Yampa rivers in Dinosaur National Monument. These trips, attended by several hundred members, also occasioned a good number of mountain ascents. Private parties accounted for much of the difficult climbing, with trips to the far reaches of the continent. Fritz Lippmann led a party of four via the Muldrow Glacier to the summit of Mt. McKinley in July. Will Siri, Dick Houston, Allen Steck, Bill Dunmire, and Bill Long climbed Mt. Robson in August and, joined by Al Baxter, climbed Mt. Victoria at a later date. Yosemite Valley climbing included one new first ascent, the northwest buttress of the Middle Cathedral Rock by Dick Long, Jack Davis, Dick Houston, Dale Webster, Bill Dunmire, and Marj Dunmire.

The California Himalayan Committee is busy organizing the Makalu Expedition for 1954.

Of interest to future Sierra Nevada climbers is the hopeful prediction that the long-awaited *Climbers Guide to the Sierra*

Nevada will be ready in 1954. The book is being edited by the Chairman of the Mountaineering Committee, Hervey Voge. The *Climbers Guide to the Pinnacles National Monument* is also being published in the 1954 *Sierra Club Bulletin.* Rock climbing sections are now active in the San Francisco Bay area, Los Angeles area, San Diego area, Fresno area, and the Sacramento area.

RICHARD C. HOUSTON

Yale Mountaineering Club. The past year has been spent in providing instruction for new members in the various phases of rock climbing and snow and ice technique, and in enlarging and strengthening the Club's safety program. A new system has been adopted in which certain members, termed Trip Leaders, are directly responsible for safety on Club climbs. These men, the most responsible members, are chosen on the basis of judgment, experience, ability, and knowledge of the local climbs and the climber's abilities. A trip leader designates the rope leaders prior to each climb. It is hoped that this system will further strengthen the safety element in club climbing and keep the Y. M. C. safety record in its unblemished state.

With the closing of the Connecticut State Parks to climbers, as a result of several recent fatalities (not Y. M. C. climbers) on the Sleeping Giant, the Club has had to seek new localities for practice climbing. In spite of the fact that there is no climbing permitted on the Sleeping Giant at present, the Club is hopeful that the cliff will be reopened soon and is in the process of formulating a Climber's Guide to Mt. Carmel. This guide will list and briefly describe the 84 known routes on the main face, many of which are yet unclimbed. This guide will be included in the contents of a bound journal which the Club hopes to publish during the next year.

Last May, the Y. M. C. took a leading part in the Safety Conference sponsored by the A. M. C., demonstrating rescue techniques to the assembled climbers from Yale, Harvard, Princeton, and the A. M. C.

In June of 1953, a party of three made an attempt on the Devil's Tower by the Weissner Route. Several others were later successful on the Durrance Route.

In August, a group met in the Tetons and in the three weeks spent there made ten ascents, including Teepee's Pillar, the Grand Teton, Mt. Owen, and Mt. Moran. Members also climbed in the Yosemite, the High Sierra, the Cascades, the Alps, and in Canada.

STEPHEN C. PORTER

CANADA

Coast Range Mountains, 1953. The Coast Range of British Columbia has long had a reputation for the magnificence of its mountains. It has equally long had a reputation for the severity of the approaches to these mountains. The classic pioneering, backpacking ventures of the Mundays attest to the difficulty of the terrain for even highly competent and skilled bush travelers. Maneuvering an expedition into this country with horses, as Hall and his companions did on several occasions, was a time-consuming and no less arduous accomplishment. The recent Harvard and Sierra Club expeditions have supplied added evidence to these hard facts: he who would enter the Coast Range must expend an undue proportion of sweat and time in breaching the lowland wilderness defenses. It was therefore an event of more than casual interest when the 1950 Sierra Club expedition affected an airplane landing on Dumbell (Ghost) Lake, at the true left ridge above the Tellot River, and, within one day, reached timberline at Nabob Pass on the Tiedemann—Tellot Divide. This accomplishment demonstrated that one of the outstanding climbing regions of Canada was now readily accessible without the necessity of a time-consuming, involved, and difficult ground approach.

For several years the party had been considering the feasibility of a trip to the Coast Range. This year plans matured to fruition. The entire project was keyed to the use of an airplane to get us in and out of the region as well as to drop supplies and equipment at a high elevation on Tellot Glacier. After some correspondence with the Queen Charlotte Airlines, arrangements were made for a chartered plane to fly four members of our party in to Dumbell Lake on July 12th, then similarly to fly the other four in and to make the air drops at the base of Dragonback

Mtn. on July 19th, and finally to evacuate the entire party on August 13th.

Sterling B. Hendricks, Don Hubbard, Alvin E. Peterson, and Jim Bullard composed the advance guard. Weather delayed their flight until the 13th, but by late afternoon the four had been landed on Dumbell Lake. The bush between Dumbell Lake and Nabob Pass is mild, and at the upper end of Tellot Creek the valley is open and flats and gravel bars are plentiful. In little more than one day of backpacking Nabob Pass was reached and a camp established. In the ensuing days, there were several minor skirmishes with the rises just west of the pass. On the 16th the party crossed the Tellot Glacier above the lower icefall and ascended the prominent ridge rising northward from the geographical left edge of Tellot Glacier to the summit. Whether this peak was Mt. McCown or Mt. Williams is still undetermined.

The advance group left Nabob Pass, moved up Tellot Glacier, and set up a high camp on a rock outcrop (ca. 9800 ft.) about one mile below Mt. Dragonback. Here they awaited the plane.

The remaining four: Arthur C. Lembeck, Ken Karcher, Jane Showacre, and Arnold Wexler, assembled in Vancouver and, on the morning of July 19th, boarded a little Norseman plane. In two hours flying time the party was transported from a major city to the wilderness fastness of Dumbell Lake, by-passing the hardships of ground travel. Showacre and Wexler then assisted in the aerial drops.

Three days later, they united forces at high camp. On the 20th, the advance party had explored the upper névés and made the double ascent of Mt. "S" and the West Peak of Mt. McCormick on the Radiant—Cataract Divide. In spite of poor visibility and freezing temperatures, Hendricks, Hubbard, Bullard, Peterson, and Showacre climbed Mt. Tellot on the 23rd. The following day the entire party ascended the East Peak of Dentiform while Lembeck, Hubbard, and Bullard also climbed the West Peak. On the 25th, there was a division into two parties. Hendricks, Hubbard, Peterson, and Bullard first ascended Mt. Argiewicz, then climbed the East Peak of McCormick. Lembeck, Showacre, Karcher, and Wexler traversed the Dragonback and Eaglehead massif.

In anticipation of a trip to the Scimitar Glacier region, Hendricks, Hubbard, and Wexler set out on the 27th to investigate the feasibility of descending to the Scimitar by way of Radiant Glacier. The big uncertainty was the Upper Radiant Icefall. They found that they were able to force a scenic route through the center of this jumbled ice mass. Then they circled around to the north of Mt. "S" and Mt. McCormick, crossed the beautiful upper névé of the west branch of Cataract Glacier, and returned via a steep ice slope between Shand and McCormick.

On this same day, Lembeck, Showacre, and Bullard executed a fine technical climb up the highest of the Upper Claws.

On the 28th, Hendricks, Hubbard, and Bullard on one rope, and Lembeck, Showacre, and Wexler on another rope, climbed Serra I via the Stilleto—Serra Col. This peak offered some very pleasant continuous rock work. The following day, Lembeck and Wexler ascended both Argiewicz and "S" while the others strolled up Mt. Shand.

Two days of dubious weather permitted some relaxation and preparation for the next phase of activities. Breaking camp on August 1st, the party descended to Scimitar Glacier by way of the Radiant. By the 2nd, they had established themselves on the Scimitar, near the base of Dissension Icefall and directly across from Mt. Hickson.

On the 3rd, eager to see some new country, Lembeck, Bullard, and Wexler ascended Dissension Icefall to Parallel Glacier, crossed the upper snowfield, and climbed the peak to the immediate north of Mt. Geddes. This they called Mt. Haworth, in memory of their friend and climbing companion who lost his life several years ago on Mt. Citadel in the Selkirks. Meanwhile, the others circled around the south of Hickson and then ascended its main summit.

The next day, while Lembeck and Wexler relaxed in camp, the others traversed Mt. Serendipity, the peak just south of Mt. Threshold above Scimitar Glacier.

On the 6th the party trekked down the Scimitar to its confluence with Cataract Creek and turned up the latter. From a camp behind the true left lateral moraine, Hendricks, Hubbard, Karcher, Showacre, and Peterson strolled up to Mt. Sepia on the

Isolation—Shiverick Divide.

At this time of the year, Cataract Glacier was in bad shape. With some luck, they managed to bridge all crevasses and return to high camp on the 8th. Then, the following morning, they descended the Tellot Glacier to Nabob Pass. The lakes, the mountain scenery, and the flora combined to make this one of the prettiest spots they had ever visited. One day, Hubbard, Karcher, and Bullard climbed Serpentine (rising just east of the pass) by way of the prominent snowfield and south arête. On another day, Lembeck and Wexler made the ascent up the southwest face immediately below the main peak.

The party's climbing was now at an end. On the 12th, they returned to Dumbell Lake. Late in the afternoon of the 13th, two de Havilland Beaver aircraft evacuated them to Vancouver.

This was a memorable trip. The weather had been favorable, the climbing excellent and enjoyable, and the country beyond compare. What more could one ask of a mountain holiday?

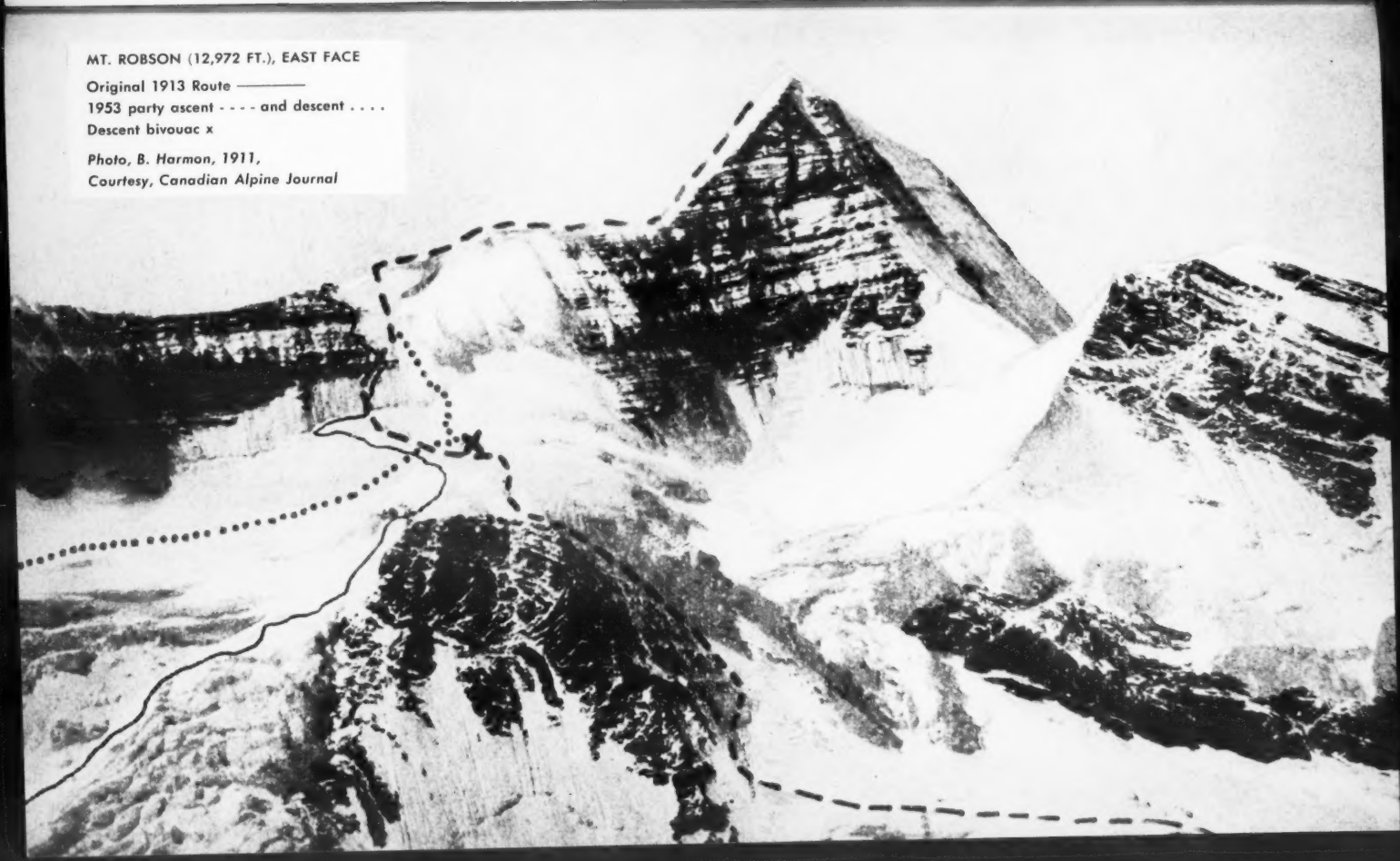
ARNOLD WEXLER

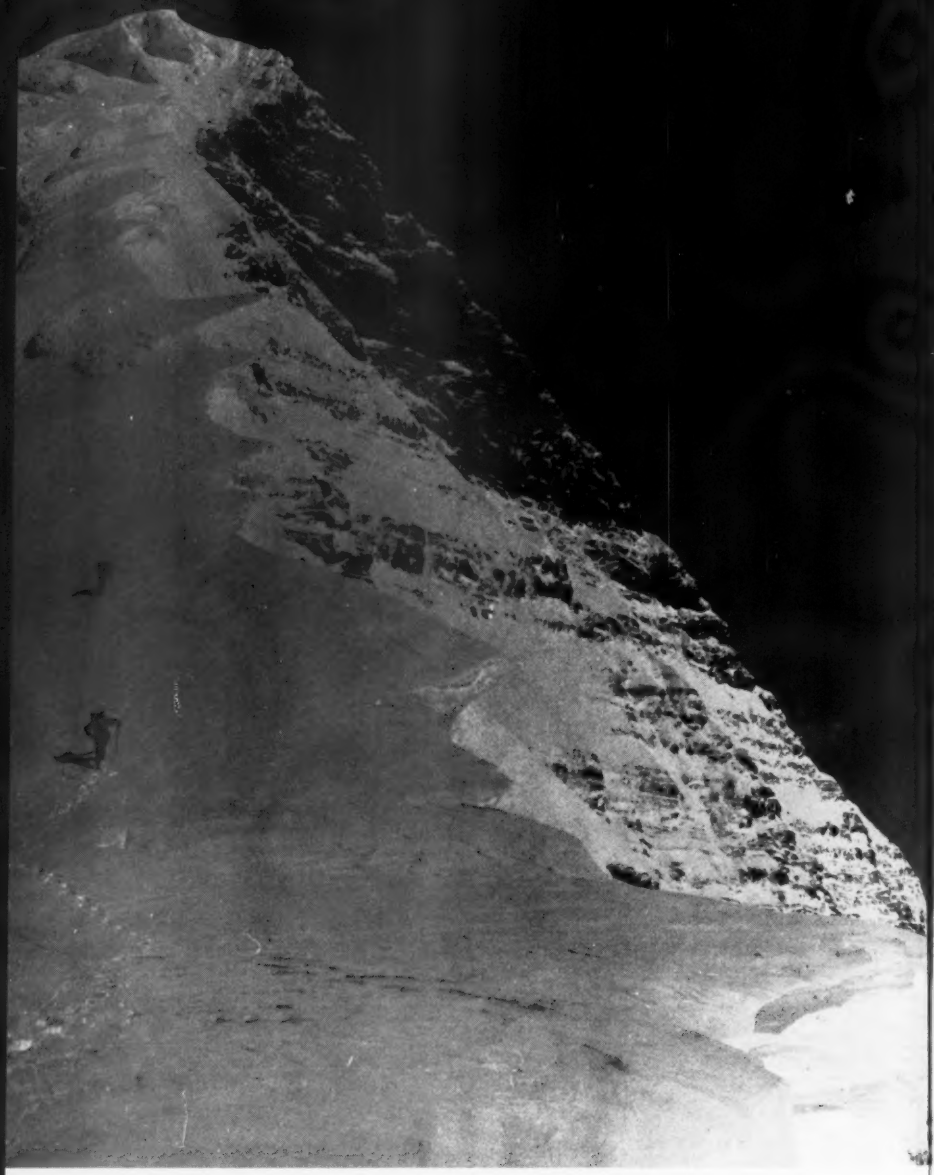
Ascent of Mt. Robson. There have been numerous attempts on Mt. Robson since its last ascent in 1939. The difficulties range from the enormous bulk of the 12,972-foot mountain to the ever-changing conditions of the upper ice cap. When this party began the eight-day assault on the mountain, it was immediately confronted with a difficulty which was to prove the main problem of the ascent—the inclement weather for which Robson is noted.

On 21 July 1953, four members of the U.C.L.A. Bruin Mountaineers, Jon Gardey, Jack Lasner, Norman Sanders and Gerrit Bratt met Don Claunch of the Seattle Mountaineers near Mt. Robson Station, British Columbia.

According to the local residents, the weather this past summer has been the worst in at least 30 years. It had been raining with great frequency for more than a 100 days, and such was the case when the party decided to camp at the end of the road and start out in the morning.

Of the several routes up the mountain it was decided to try the south face. One close look at the ice seracs and cornices of the


MT. ROBSON (12,972 FT.), EAST FACE
Original 1913 Route ————
1953 party ascent - - - - and descent . . . .
Descent bivouac x
Photo, B. Harmon, 1911,
Courtesy, Canadian Alpine Journal



FINAL 1,700 FEET OF THE CORNICED SOUTHEAST RIDGE OF MT. ROBSON

Photo, J. H. Gardey

upper Wishbone Arête turned all thoughts to the southeast glacier. Claunch's experience in two previous attempts on the southeast route was the deciding factor.

The walk began late the next morning in a heavy rain, the party taking the pack trail for three muddy miles to 3,000-foot high Kinney Lake. From Kinney Lake a snow-filled chute offered a convenient route upward for 1500 feet, between the cliffs which comprise the mountain's lower fortification. Leaving this chute, the party passed over ledges and slabs to timberline at 6000 feet. Camp was pitched that night in the rain, and it was not until 2:30 P.M. the next day that the climb was continued up dangerously wet rock slabs amidst snow and hail flurries to 7800 feet.

The next three days were spent in two camps at about this same elevation, with the hope that the weather and snow conditions would at length become favorable. The first day the camp was moved a few hundred feet higher to the level of the icefall from the lower glacier, but the second and third days were spent in boredom and anxiety. One reconnaissance, however, was made onto the first glacier.

Five days had now been spent on the mountain, and thunderstorms and flurries had brought about three inches of new snow. Since the weather would obviously not subside, it was decided definitely to try an attack the next day.

The next morning, July 27th, the five climbers set out with equipment for a bivouac for two nights; it consisted of one two-man mountain tent, two primus stoves, one sleeping bag, and ample food. By the time the party was on the first hanging glacier, the weather began to close in. The west side of the glacier was followed in knee-deep snow, with very poor visibility. The upper and lower glaciers are separated by an ice wall of 200 feet. A 50-degree snow finger on the east side of the wall leads ultimately to the southeast arête, and from this finger a route may be made on to the upper glacier. The ascent of the snow finger was straightforward, except that the snowstorm and surface snow slides made belaying difficult. After following the finger for 200 feet, steps were cut into a 60-degree slope leading onto the upper glacier. On the waste-deep snow of the upper glacier a heavy fog limited visibility to ten feet, producing the well known "white-

out" effect which makes other climbers look as if they floated in white space. An acute sense of direction enabled the party to reach the foot of a great bergschrund separating the glacier from the upper ice cap, at an elevation of 11,000 feet. It was getting rather late, and, although the weather was beginning to clear, a decision was made to remain until the next morning, since the lower lip of the bergschrund afforded a good spot for a bivouac.

The next morning, July 28th, fortunately brought the best weather of the entire trip. After the inevitable spilled pot of cereal in the tent, crampons were again adjusted and the ropes straightened out. Leaving the tent and equipment, the party proceeded west until a place was found where the bergschrund could be surmounted with a bit of step cutting. A short rest was made after the southeast arête was gained. The arête, a series of large cornices which rise 1700 feet at a constant 45-degree angle, was perhaps the most dangerous part of the climb. The climbers remained on the arête in two ropes, even though cornices went crashing down a few feet from them. Wading in snow which reduced the effectiveness of the crampons, they approached another bergschrund 250 feet from the summit. This was the point at which Claunch had been forced to withdraw on his last attempt because of high wind and bad weather. From a technical standpoint this was the most interesting part of the climb, requiring the cutting of a great number of steps on a face that descended to Kinney Lake, now nearly 10,000 feet below. Once the bergschrund was finally surmounted, the ascent was readily made. An hour was spent on the summit, taking photographs and placing an American flag with a record of the first ascent in 14 years of the highest peak in the Canadian Rockies.

GERRIT T. BRATT

Mt. Robson from the East. "God made the mountains, but good God! who made Robson?" exclaimed Conrad Kain, who led the first ascent in 1913. It was with high hopes, but with bleakly realistic expectations that Dave Bernays, Craig Merrihue, and Dmitri Nabokov set out to climb Robson; our ambition was not to use the relatively straightforward traditional route on the south side of the mountain, but to make a second ascent by Kain's original itinerary.

Arriving by hearse from the Harvard Mountaineering Club climbing camp in the Northern Selkirks, the party went from Jasper by the new dirt road to Robson Station. After 50 miles through the Yellowhead Range and other foothills, our growing impatience was abruptly dispelled as we beheld Robson for the first time, its summit veiled in dark storm clouds, a peak both ominous and majestic.

The first night was spent in the yard of Roy Hargraves' ranch. It was decided that the following day, if the weather improved, Roy would send packhorses with us to his Berg Lake Chalet, which was to be our farewell contact with civilization. Sunday, August 9th, dawned bright and promising. The morning was devoted to general organization and making up of loads for the horses. Soon after midday the party set out, accompanied by two packhorses under the charge of a mounted guide and a personable young lady on her way to take over housekeeping duties at the chalet. The entire caravan arrived at the chalet just at nightfall.

The following morning, again a beautiful one, we departed for the lower Robson Glacier. As we ambled the pleasant mile and three-quarters to the glacier behind our little pack train, our imagination was dulled and we did not think of the abrupt cessation of luxury awaiting us at the edge of the ice and stemming from the unfortunate fact that a crampon had not as yet been devised for pack animals. After the initial shock had passed, we resolved to take the largest loads possible on our first trip up the glacier and return for the rest. Each laden with some 75 pounds of equipment, clothing, and food, the party trudged up the easy slope of the lower glacier. Camp I was established comfortably below the icefall, and a pleasant night, interrupted only by occasional glacial creaking, was spent by all.

The next day was passed in a reconnaissance, with three objectives: first, it was necessary to find the best route through the icefall; second, to decide upon a second campsite; third, to supplement theoretical route planning with a good look at the mountain itself. The basic plan of attack was to mount the Dome, the shoulder below the main ridge of Robson, and to climb from a high camp there. Our observations, however, did not reveal a straightforward way onto the Dome. The possibili-

ties consisted of a crevasse-ridden circumvention to the southeast, or left, of the Dome (roughly Kain's route of ascent), a scramble up a rather tenuous rock gully on its face, and a traverse on snow to the right, or north, of the Dome, alarmingly close to the trajectory of frequent missiles from the upper icefall. We decided, therefore, to establish high camp on the upper glacial plateau, at the foot of the Dome. On the reconnaissance we had tried to cross the icefall as low (i.e., its westernmost portion) as possible, where we had hoped to encounter more or less gentle terrain. This way, however, turned out to be rather unpleasant for a heavily-loaded party; camp was moved on the 12th via a much more easterly route, at the steepest, but at the same time the shortest and simplest part of the icefall. We ascended an obvious ice trough near a spectacular cave in the ice wall, climbed past a most alarming teetering serac, found our way across several large crevasses at the top, and crossed the moraine of the upper glacier to reach the new campsite.

August 13th presented us with the most magnificent morning to date. Robson glistened in the early sun, its summit seemingly within a snowball's throw of camp. Leaving at four, we followed the third of the previously-considered routes, not a bad choice, it turned out, but also not the best. Using crampons from the start, we kicked up easy snow and scrambled over some outcroppings of rock, to arrive on a broad shelf consisting of the twisted masses of the upper icefall, directly to the right, or northwest, of the Dome. We proceeded up the Dome itself by a direct route over snow and ice to the west of the rotten rock ridge and just to the east of the principal avalanche chute.

After a brief snack on top of the Dome, we set out, at about eleven o'clock, across a wide shelf of rolling snowfields and approached the central mass of the mountain, the principal problem of the climb. We were confronted with a formidable ice slope, ranging in angle from 50° to 60° and supporting a small hanging glacier in its upper reaches. This wall had been the impasse for many parties and the object of much speculation for ours. Kain's party had been obliged to chop many of its 600 steps here, while we found ourselves blessed with almost ideal conditions, which enabled us to kick steps nearly all the way

to the ridge crest, except for a minor and fruitless digression onto adjoining rocks to the south (where much of Kain's route lay). The last 30 feet required considerable care because of very poor snow.

It is a tribute of sorts to the optimism of Robson mountaineers that the great majority have been benighted on their way down. Bernays' proposal that we carry sleeping bags at least part of the way up the mountain was met, therefore, with unanimous approval. The crest of the ridge was reached at 2:30 P.M.; since the weather was as excellent as had been our progress, we decided to leave the bags at this point.

The direction of the climb now changed. Advancing northwestward, we enjoyed a pleasant walk along the crest of the knife-edged arête, which soon faded into the southeast face. Light clouds now obscured the upper portion of the route. We soon noticed willow wands of a green variety, marking the route onto the ridge from the west followed by three previous parties during the summer. Further testimony to the recent presence of other climbers was the remains of the Sierra Club group's camp on a shoulder more than a thousand feet below, to the west. Beyond this shoulder and far below it, one could see Kinney Lake and the valley of the Fraser, through which we had passed four days before. After two hours of easy but spectacular traveling, we arrived at the base of the summit mass. It was necessary to make a long traverse of the south face under a large overhanging ice cliff to reach the only gap through which the summit could be gained. The final pitch proved the most dangerous of the whole climb; it consisted of an 150-foot ice slope close to 70° at its base and tapering off to about 30° at its top, and encrusted with frost feathers up to three feet in thickness. Merrihue's 120-lb. weight here stood him in good stead. He negotiated this difficult bit with admirable competence. Bernays and Nabokov, both considerably heavier, found the going a little more exciting. From the top of this pitch it was 15 nearly-level yards to the summit.

On top we found a tattered American flag, left by one of the previous parties and anchored in a most thorough fashion. It was now 4:30 P.M.; a quarter of an hour was devoted to eating

and photography before the descent began. Once the slightly thin topmost pitch had been passed, the arête presented no problems. Progress down the long ice slope, however, was slow; once the sun had left the slope, the snow had frozen so hard that crampon points would barely stick in the surface. Crossing the upper schrund at a more comfortable point than on the way up, we arrived on the Dome just as the last rose tints of sunlight left the snows of Mt. Resplendent. The satisfaction of our success and the magnificent, almost palpable, beauty of this twilight spectacle made us forget for a moment the two vital questions before us. The first, i.e., where to spend the night, was quickly solved for us, as it immediately became dark and cold. Finding a reasonably convenient crevasse, we settled down to a cool but not uncomfortable night.

The second question faced us upon awakening in the warmth of another perfect morning: Should we return to camp by the route of the previous day or follow a very promising alternative that now presented itself? The first course was ruled out as dangerous and generally unpleasant. The route followed consisted of an eastward traverse of 500 yards about 100 feet below the crest of the Robson—Resplendent ridge to a point whence a direct descent was possible. Near the bottom of this slope we encountered a delightful spot for those who like to jump bergschrunds. Bernays, seating himself inside the schrund, took magnificent pictures of the aerial descent of the rest of the party. We returned to camp at noon, exceedingly hungry and tired, but nevertheless the happiest of men.

DMITRI NABOKOV

ALASKA

Mt. McKinley Map, Second ascent of Mt. Brooks, second and third ascents of Scotts Peak, Alaska Range. During the summer of 1953, the U. S. Coast and Geodetic Survey and Boston's

THE GREAT BERGSCHRUND,
where a bivouac was made at 11,000 feet. Two climbers may be seen at the site of the bivouac on the lower lip of the bergschrund.
Photo, J. H. Gardey

Museum of Science completed a long series of field observations which, it is hoped, will lead to a new and accurate large-scale map of Mt. McKinley and its approaches. The large Coast Survey party, under the leadership of Lt. Commander Howard S. Cole, was equipped with two cub airplanes and two Bell helicopters. During 1952 and 1953 this group completed a first-order triangulation network from McGrath to the Alaska Railroad near Healey. The eastern portion of this survey paralleled the McKinley Park Highway and tied in to Bradford Washburn's network at Camp Eielson and Wonder Lake. This party did no high-mountain work at all, confining their observations to stations below an altitude of 6000 feet.

Barbara and Bradford Washburn, accompanied by Chauncy W. Waldron, Jr. and Edward A. Ames (H.M.C.), spent 70 days in the mountains just east of Mt. McKinley, completing precise observations for the altitude and position of the major peaks in this area, in close collaboration with the Coast Survey party. Radio contact was maintained between the two parties, and the Boston group made considerable use of the two helicopters in establishing their advance base camps on Muldrow and Sun set glaciers.

This party made the second ascent of Mt. Brooks (ca. 11,950 ft.) on July 19th, using the same route (the N. ridge) as that followed by the Harvard party in 1952. A night was spent on the summit in a snow cave in order to capitalize on perfect early-morning survey conditions on July 20th.

Hopped from Muldrow Glacier over to Sunset Glacier (24 miles) by helicopter on July 22nd, this Boston group made the first ascent of Scott Peak (ca. 8850 ft.) on July 23rd, spent the night on the summit, and concluded survey observations there on the following morning. Scott Peak is the highest peak in the Alaska Range immediately south of Camp Eielson (Mile 65) on the McKinley Park Highway. It lies on the very backbone of the

MT. RESPLENDENT FROM THE SOUTHEAST RIDGE
at 12,300 feet. The path of the climbers may be seen approximately 1000 feet below on the ridge, separating into two distinct paths, one for each rope, then descending over the bergschrund at 11,000 feet.
Photo, J. H. Gardey

range, 33 miles east of Mt. McKinley, and occupies a position of extreme importance from a survey standpoint. It was first climbed in 1952 by David Bernays, Morton S. Wood, and Ija Korner, who followed the Sunset glacier to its head and then climbed to the summit, for the most part by way of the main central ridge at the head of the glacier. Camps were established at 5000 feet at the main bend of Sunset glacier and at the base of the ridge at about 6300 feet. No major difficulty was encountered, except in the form of incredibly rotten rock.

In 1953, when Washburn's party planned to repeat this ascent for survey purposes, a new route was picked in order to minimize steep backpacking on this rock. Constant cloudy weather in June obscured the head of Sunset glacier; so an advanced helicopter camp was set up on June 16th (elevation 5600 ft.) near the head of the extreme western fork of the Toklat river. Supplies were backpacked from there to another camp at 7600 feet on the north ridge of Scott Peak, and Ames, Waldron, and Washburn made the first ascent to the top via the new route on June 26th (Mrs. Washburn did not join the party till July 2nd). The rock on this ridge (N.), too, was so terribly loose and treacherous that it was deemed unsafe to use as a route for packing food and equipment to the summit. For this reason, the completion of the survey work from Scott Peak was postponed until after the Brooks climb, a month later.

The July 23rd ascent of Scott Peak was made by still a third route, which successfully evaded all rotten rock. The climb was made all the way from the main bend of the Sunset glacier (5300 ft.) in a day. A low icefall near the head of the glacier was turned to the left (NW.) in order to reach the plateau at the glacier's head, exactly as done in 1952 by Bernays' party. The glacier was then crossed to the S. side, whence a thousand-foot climb up moderately steep snow slopes led to a 7400-foot unnamed col which is the lowest point in the crest of the Alaska Range, about a half mile south of the top of Scott Peak. The other side of this col drops away in steep ice slopes to the upper valley of the West Fork of the Chulitna river.

From this spot, instead of following the crest of the ridge to the summit of the Peak, the party kept on the Southeast side,

where excellent snow slopes lead to another little snow col (8400 ft.), a few hundred yards to its right (E), from whence the top is easily reached on a beautiful snow arête. When this detour is made, all rock is avoided. It would seem that there is not a single stable rock anywhere on Scott Peak! This route is described, perhaps, in more detail than should be accorded an 8800-foot mountain, but the view from the top of this peak is so magnificent and its ascent so easy and safe from Camp Eielson, that it is hoped it can be climbed many more times in the future.

Although the lengthy computations resulting from this field work are not yet completed, it appears almost certain that Mt. McKinley will have a new official elevation of slightly less than 20,350 feet before the end of 1954.

BRADFORD WASHBURN

SOUTH AMERICA

Andes, Argentina. In February 1953, the Swiss couple, Dr. and Mme. Fred Marmillod and the Argentinians Francisco Ibáñez and Francisco Grajales made the first ascent of the south ridge of Aconcagua (23,036 ft.). The climbers reported that although the route was not difficult, it was more interesting and Alpine than the standard route.

Early in 1953 a group from the Círculo Andino Buenos Aires made the following first ascents in the Aconcagua region: Cerro Zurbriggen (18,040 ft.), Cerro Fitzgerald (17,220 ft.), Cerro Reichert (17,036 ft.), and Cerro La Mano (18,368 ft.).

Andes, Chile. An expedition of the Club Andino de Bariloche climbed Cerro San Valentín (13,310 ft.), the highest point in Patagonia, on 13 December 1952. They approached the mountain up the 25 mile-long San Rafael Glacier from Laguna San Rafael on the Pacific, establishing five camps on the mountain itself.

On December 1st, Juan Harseim and Bion González of the Club Andino de Chile climbed the Volcán Llullaillaco (22,051 ft.) in northern Chile. No ascent is recorded, but they were amazed to find on the summit rock alignments of the kind made

elsewhere by the Indians before Columbus discovered America.

Ociel González of the same club made the first ascent of the north peak of the Marmolejo (20,008 ft.) in Central Chile on 15 January 1953.

Luis Krahl, Sergio Kunstmann, Eduardo Meyer, and Ernesto Hoffmann climbed the Cerro del Castillo (17,991 ft.) on 27 February 1953. This first ascent provided considerable technical difficulties in the three days it took them to make the actual climb.

Andes, Peru. In July and August, 1952, Piero Ghiglione led an Italian expedition which climbed Cerro Verena (18,860 ft.), Cerro Lomellini (18,040 ft.), both names not official, and Volcán Solimana (20,500 ft.). They also climbed three of the summits of the Ausangate group, though not the highest. In 1953 Ghiglione led a joint Italian—Swiss expedition in Peru. He and Felix Marx climbed Lasontay about (19,000 ft.), the shoulder of Humantay (to an altitude of 18,700 ft.), Colquepunco (19,680 ft.), both summits of Halancoma (18,434 and 18,652 ft.), and Huacratanca (19,385 ft.).

In June the German expedition of the Akademischer Alpen Club Munich, consisting of Fritz März, Heinz Steinmetz, Jürgen Wellenkamp, and Heinrich Harrer reached the highest summit of Ausangate (20,182 ft.). They established high camps at 16,070 and 18,700 feet.

Two ascents were also made of Peru's highest mountain, Huascaran (22,463 ft.), by Peruvian and Mexican parties.

H. A. CARTER

Andes, Peru, Yanauccha and Huaytapayana Ranges. Richard Kimball, my wife, Alice, and I spent the second week of August, 1953, climbing and exploring the Yanauccha and Huaytapayana ranges of central Peru. We drove our equipment and food to Huancayo on the main Andean road, then headed east a dozen miles or so on a back road to the Acopalca hacienda. Here the manager, Sr. Chaparro, supplied us with horses, packers, cheese, fresh meat, and some information. Although he told us of the ascent of the Nevado de Lasontai ten days earlier, he did not know much about the mountain country behind the front

Lasontai and Huaytapayana ranges. Even the naming of the front peaks was confused; only Lasontai and Huaytapayana are definite. These ranges guard a heavily glaciated, rugged area about 30 miles wide from northwest to southeast and of undetermined length.

With horses and packers we crossed a high pass just northwest of Huaytapayana Peak to an enormous bowl valley enclosed by a solid rampart of unclimbed and unnamed peaks. Wet set up our base camp by two tiny ponds perched above a large moraine-dammed lake, which our Indian packers called Yanaucccha (black lamb). They also gave the same name to the 18,300-foot peak above it, but knew no other names here. They said there was a similar bowl valley to the east, mentioning Chuoc and Huaracayo as names of the two big mountains above it.

During our week of climbing we made a dozen ascents. Of these, five were rock peaks which ranged in altitude from 17,000 to 17,500 feet. None of these was technically difficult. The rest of the climbs were primarily on snow and ice. The 18,300-foot Nevado de Yanauccha was the highest and most interesting mountain ascended. We followed the heavily corniced southeast ridge along the backbone of the Yanauccha range. From the eastern end of this range we saw and mapped the seven peaks of the adjacent Huaracayos, giving the names Chuoc and Huaracayos to the two finest, each about 18,200 feet high, precipitous, and of mixed rock and ice. This small group would well repay a climber's efforts to get to it. And beyond the Huaracayos are ranks and ranks of other fine peaks.

Our technically most exacting climb was the southwest ridge of Lasontai. We tried the peak from the Yanauccha-Lake side, hoping to make a different route to the top from Ghiglione's northwest side from Lasontai Lake. In threatening weather, typical in the heart of the range at this season, we ascended the ridge with some difficulties to 18,600 feet, about 400 feet from the summit, where a complete transverse break in the ridge stopped us. We were unable to cross it on the western side, as we had hoped. After a week of intense activity our venture came to an abrupt end and with the return of the packers the long jog back to Acopalca began. In only a week we made nine or ten

new ascents (several of the Huaytapayana peaks we climbed had probably been climbed by Arnold Heim in 1946).

FREDERICK L. DUNN

ASIA

Nanga Parbat. Finally after 7 unsuccessful expeditions and 31 deaths, 14 of them sahibs and 17 porters, Nanga Parbat has been climbed. At seven o'clock in the evening of 3 July 1953 the 29-year-old Austrian, Hermann Buhl, member of the "German-Austrian Expedition in Memory of Willy Merkl" stood on the summit of the 26,658-foot giant of the western Himalayas, the second highest peak yet climbed.

It has not been easy to present the facts about the expedition. There has been considerable controversy aired in the press, and the accounts by various members of the climbing party differ considerably. Even before nine of the ten climbers left for India on April 17th, there were bitter quarrels among the sponsoring groups, and the German Himalaya Stiftung under Paul Bauer and the Deutsche Alpenverein withdrew their support from Dr. Karl Herrligkoffer, the leader of the expedition and half-brother of Willy Merkl who died on the mountain in 1934. When the group reached Pakistan, they discovered that the Sherpas they had engaged were not granted permission to join them. However, the Pakistani government, giving them excellent cooperation, arranged for Hunza porters, who, though not trained mountaineers, rendered fine service in establishing their high camps. They reached base camp at 13,000 feet on May 15th, where they were joined by the leader of the climbing group, 51-year-old Peter Aschenbrenner, veteran of the 1932 and 1934 expeditions. The work of establishing the high camps began immediately. Camp I at 14,650 feet and Camp II at 14,650 were placed at the same spots as in previous years, but Camp III was set up on June 10th at 20,300 feet on a small plateau where in other years Camp IV had been. Here storms struck them and it was not until June 18th that at 22,000 feet, at the foot of Rakhiot peak, Camp IV was established in caves dug in the snow. Bad weather continued to plague the climbers, and although they reconnoitred the route up the ice slope on Rakhiot Peak and

carried up some loads, they were stormbound for days at a time. Finally when the weather cleared on June 29th, Hermann Buhl, Hans Ertl, Otto Kempter, and Dr. Walter Frauenberger at Camp II received an order by radio from the base camp to evacuate all the camps on the mountain. There is some confusion as to whether they disregarded this order or whether it was rescinded. In any case, while the lower camps were being evacuated, cutting them off from all communication from below except by radio, the four climbers ascended to Camp IV. On July 2nd, with the help of four Hunza porters, they climbed the formidable Rakhiot Peak slope and set up a camp for Buhl and Kempter in a low point on the ridge between Rakhiot Peak and the Silbersattel near the "Moor's Head." Although this Camp V was comparatively low, being nearly 4,000 feet below the summit and four miles distant from it, the threatened onslaught of the monsoon made them decide to try for the summit from there.

During the night there was a frightful windstorm, but by one o'clock in the morning it had died down. Buhl cooked breakfast and prepared to leave at 2 A.M. He claims that Kempter at first refused to get up but that while he was preparing to go alone, Kempter finally awoke. He removed most of the food for the climb from his rucksack and put it into Kempter's, expecting him to follow, and left at 2 A.M. His companion did not leave until 3 A.M. Kempter's story is that Buhl simply gave him the slip ("Buhl ist mir einfach davongelaufen") and departed alone for the summit. Separately and with excellent snow conditions the two climbed the long ridge and up to the Silbersattel, where the 1934 party was struck by the fatal storm in their 24,500-foot Camp VIII. Buhl reached the saddle at about seven o'clock and Kempter three quarters of an hour later. Looking back as he crossed numerous ridges of hard drifted snow on the two-mile-long plateau that ascends gently to the summit ridge, Buhl saw Kempter reach the Silbersattel, stop, and lie down. Kempter says that it seemed hopeless to try to catch Buhl, so he sat down and fell asleep. The comparatively warm air, unstirred by the wind, sapped his energy, and he dozed from time to time all day until 5 P.M. when, still not seeing Buhl returning, he began his descent to Camp V.

Meanwhile Buhl continued up to the base of the lower peak,

where he left his rucksack and climbed on, turning the peak on the northern slope. At two o'clock he stood on the final ridge, a thousand feet from the summit. This ridge, which was alternately corniced snow and rather rotten rock gendarmes, at several places offered serious climbing difficulties. Feeling his strength failing him, Buhl took two Pervitin pills (apparently benzidrine) and drank the last of his "tea" brewed from coca leaves. At seven o'clock he finally unfurled Tyrolean and Pakistani flags on the summit and took photographs, of which unfortunately only one came out. It was already sunset, and he had to start the long way back. Night overtook him struggling downward without his ice-axe, which he had left on the top with the Pakistani flag attached. One crampon kept falling off. He spent the night about 500 feet below the summit without food, drink, or extra clothing on a 45°-slope on a large rock that wobbled when he moved. He did not dare sleep and could hardly move although he realized that his feet were becoming frostbitten. Finally at dawn he again began the painful climb down, plagued by thirst, hunger, and fatigue. He was bothered by hallucinations, imagining that someone was with him. It was not until 5:30 P.M. that he reached the Silbersattel. He first picked out four climbers who were on the way down from Camp V to Camp IV. These turned out to be Kempter and three porters. Kempter had not been above Camp V all day. He then saw Frauenberger and Ertl at the Moor's Head, dedicating a tablet to the memory of those who died on the mountain in 1934. These two gave him a joyous reception when he staggered into Camp V.

Dhaulagiri. A very competent Swiss expedition of the Akademischer Alpen Club Zürich failed to reach the summit of Dhaulagiri (26,795 feet) in Nepal. The group under the leadership of Bernhard Lauterberg consisted of Dr. Ruedi Pfisterer, André Roch, Hannes Huss, Marc Eichelberg, Ruedi Schatz, and Peter Braun. They landed by plane at Pokhara, took a pack train to Beni, and forced their way up the difficult Mayangdi Khola Gorge and reached base camp on the northwestern side of the mountain at 11,600 feet on May 2nd. From Camp I in a glacial cirque at 14,850 feet they carried out an extended reconnaissance. The route chosen lay over a rock and ice buttress, into the north-

face icefall, to a 5,000-foot steep snow face up which they hoped to climb to the west ridge at a point about 1500 feet from the summit. Camp II at 16,830 feet and Camp II at 18,150 feet were established on the buttress and at its top. Camp IV at 19,500 feet was at the foot of the snow face and Camp V at 21,450 was dug into the slope about half way up it. From this high camp Schatz and Braun set out with three sherpas, who carried oxygen equipment, to try for the summit. At 23,600 feet the latter turned back and on the descent slipped in a snow gulley and fell more than 1500 feet. Miraculously they checked their fall unhurt at the very brink of an ice cliff. Meanwhile the climbers continued on, using oxygen, up a slope which threatened to avalanche. At about 25,200 feet the steep snow gave way to even steeper powder snow-covered slabs, almost devoid of holds and those few sloping the wrong way. They abandoned their try after climbing to within 200 feet of the crest of the western ridge, having reached about 25,400 feet. They realized that they could not make the top without another camp and could see no possible camp site. The expedition returned, having reconnoitred what they feel is the only route up the mountain and having mapped its northern and western sides. They also reached the northeast and southern cols, completing the reconnaissance of all sides of the mountain which was begun by the French in 1950.

Panch Chuli. P. W. Nikore, the leader of an Indian expedition on 27 May 1953 claims to have climbed Panch Chuli (22,255 ft.) in Garhwal in a two-day ascent from his high camp. The Scots had failed in 1950 and the Germans in 1951 on this mountain. Doubts that the summit was reached continue to be reported from Indian sources.

Abi Gamin. The Bengal Royal Engineers Kamet-Abi Gamin expedition under the leadership of Major N. D. Jayal made the second ascent of Abi Gamin (24,130 ft.) in Gahrwal. After getting to within 100 feet of the top on June 16th on the east ridge, a smaller party consisting of Jayal, Sherpa Pemba, and Garhwali Pooran Singh climbed to the summit by the south face. This is a different route from that taken by the Anglo-Swiss party in 1950 who climbed from the Tibetan side.

Kabru. J. W. R. Kempe and G. C. G. Lewis in May ascended

Kabru (24,075 ft.) from the northwest on the Nepalese side. This is a new route, since C. R. Cooke's 1935 route led up from the Rathong Glacier in Sikkim.

Annapurna. The postmonsoon Japanese expedition of the Unversity of Kyoto is reported to have failed.

Mt. Everest, Russian attempt. Two Sherpas who have arrived in Kathmandu report details on the Russian Everest attempt. After being flown to Lhasa in mid-October, 1952, aided by local porters, the expedition took longer in its approach than they had expected. On the mountain itself they used only 36 specially trained porters brought from the Caucasus to aid the six climbers, who were under the leadership of Dr. Pavel Datshnolian. They followed the standard British route and established Camp VIII at about 27,000 feet. A last radio message declared that they intended to make a bid for the summit the next day. Although other members of the expedition searched up to Camp VIII and above, no further traces were found of them. The expedition left the region in late December. A second search in the spring of 1953 revealed absolutely nothing more. It is reported that the Russians will make a further attempt in 1954, again with Caucasian porters. Some doubts as to the Russian attempt on Everest have been expressed from competent sources.

H. A. C.

HEIGHT OF EVEREST:

Department of Geology
University of Otago
Dunedin, N. Z.

3rd June, 1953.

Sir,

In view of the outstanding news from Mt. Everest, and the crowning achievement of the British party, aided so notably by N. Z. climbers, it may be appropriate briefly to comment on the question of the elevation of this culminating peak of the Himalaya, a matter indeed that is frequently cited. In spite of all that is claimed in some contexts to the contrary, the officially accepted height of Everest is 29,002 feet. The latter mean value for its altitude was computed by the Survey of India as long ago as 1852, and no later values, such as that of 29,141 feet, obtained from further field observations made between 1881 and 1902, have been

accepted as more reliable or nearer the actual height. It is not true that 29,141 feet is a later "corrected" figure, as has been stated by some "authorities." The reasons for this are somewhat complex and technical, but they are mainly due to the various factors that enter into the calculations, each of which factors is not easy to assess, and whose adopted values must necessarily make for considerable differences in the final computation. Briefly these factors are, (a) the acceptable surface, or "datum," above which the height is to be measured; (b) the effect of refraction of the air through which the rays from peak to instrument pass; and (c) the disturbing influence of the local force of gravity upon the instrument and its levels. All these factors, moreover, can vary from time to time, and from place to place.

Although there are certain geological and geophysical reasons for the assumption that the Himalayan range, at any rate in part, may be slowly rising, we are quite uncertain of the amount of possible rise; nor did the recent Swiss Expeditions make, or could they justifiably make, any claim of having measured that rise, as was reported in some newspapers. Professor Lombard, the geologist of the first Swiss party, has assured me that this claim was the invention of a newspaper man, who entirely misunderstood Dr. Wyss Dunant, the leader of the Expedition.

One further item of 'debunking' is perhaps apposite. The picturesque and oft-quoted story that an Indian computer had been responsible in the first instance for the determination of the supreme elevation of Everest, when he announced the fact on rushing into the Surveyor General's office, is quite incorrect and apocryphal, and has been denied repeatedly by the Survey of India. A good story, however, inevitably and unfortunately dies hard!

Yours faithfully,
N. E. Odell
N. E. Odell, Professor of Geology

To the Editor,
American Alpine Journal, New York.

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